



Factors Associated With Domestic Violence: A Cross-sectional Survey Among Women in Jeddah

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Factors Associated With Domestic Violence: A Cross-sectional Survey Among Women in Jeddah

Keywords: Domestic violence, emotional abuse, physical abuse, sexual abuse, women

Word count: 2025

For peer review only

Abstract

Objective: This study aims to identify the factors associated with domestic violence (DV) among women in Jeddah.

Design: Cross-sectional survey.

Setting: Outpatient departments of three tertiary hospitals in Jeddah.

Participants: Convenience sample of women at the outpatient and inpatient clinics, aged 15-70 years.

Interventions: Between December 15, 2011 and May 30, 2012, a psychologist and a professional health assistant explained the purpose of the research to participants, who were then asked to fill a 50-item questionnaire. The questionnaire was created based on questions from three questionnaires: the NorVold Domestic Abuse Questionnaire, the Pregnancy Risk Assessment Monitoring System, and the Kansas Marital Satisfaction Scale. The questionnaire was used to assess the association between DV and family status, male partner attitudes, age, educational attainment, employment, financial, and socio-economic status.

Results: A total of 2301 women participated in the survey (81% response rate). The mean \pm SD age of the participants was 34.4 ± 10.9 years. Abused women had more children than non-abused women ($P=.001$), and their spouses were significantly older than those of non-abused women ($p < .0001$). Financially-dependent women and those with a high educational status were significantly more likely to report abuse ($p= .003$ and $p<.001$, respectively). Abused women were also likely to report that their spouse was a

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smoker ($P<.0001$) and had completed at least primary or secondary education ($p<.0001$). A significantly lower proportion of abused women reported that their male partners were alcohol users ($p= 0.001$).

Conclusions: Many factors are associated with DV against women, hence highlighting the need to design effective DV prevention programs.

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Article Summary

Article focus:

- The aim of this study was to identify the factors associated with domestic violence (DV) among women.

Key messages:

- Domestic violence is an important health problem in Jeddah.
- Identifying the factors associated with domestic violence is an important step toward designing effective domestic violence prevention programs.

Strengths and limitations of this study:

- Only women were surveyed, and the data relied solely on the reports of the participants.
- We recruited a convenience sample of women owing to the difficulties in approaching leaders of women's gathering groups, who were hesitant to give their approval because of the relatively sensitive nature of our theme.
- We did not report factors such as the gender, race and ethnicity of the psychologist and health assistant who were present during data collection. These factors would have been important to consider when estimating the reliability and validity of our questionnaire.

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- Some women did not respond to certain questions for fear of disclosing too much personal information.

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INTRODUCTION

Domestic violence (DV) is a common problem that affects men and women worldwide. It was a formerly neglected public health problem, which has gained more visibility over the past few decades. Since its recognition as a serious human rights abuse and important public health problem at key international conferences during the 1990s, including the Fourth World Conference on Women,[1] researchers have shown the increasing prevalence of violence perpetrated on women by their male partners. It was estimated that between 10% and 52% of women from 35 countries worldwide reported they had been physically abused by an intimate partner at some point in their lives, and approximately 10-30% reported they had experienced sexual violence by an intimate male partner.[2, 3]

In the Middle East, there is a paucity of studies on DV although there is a growing body of evidence highlighting the magnitude of this problem among women in developing countries.[4] Findings from previous studies conducted in Egypt, Israel, Palestine, and Tunisia indicate that at least one out of three women was a victim of DV.[4, 5] Until quite recently, DV was a hidden problem in Saudi Arabia. Only few studies have reported the prevalence of DV among women in three different regions of Saudi Arabia, with prevalence rates ranging from 39.3% to as high as 57.7%.[6, 7] however, the factors associated with DV have not been identified in any study conducted in Saudi Arabia, which is an important step toward designing effective DV prevention programs. The aim of our study is to identify the factors that are associated with DV against women in Jeddah, Saudi Arabia.

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METHODS

Subjects

A cross-sectional survey was performed between December 15, 2011 to March 30, 2012 at three tertiary hospitals in Jeddah, namely King Abdulaziz University Hospital, King Abdulaziz Oncology Medical Center, and King Fahd General Hospital. King Abdulaziz University Hospital was the first university hospital, created in 1956. King Abdulaziz Oncology Medical Center is the largest hospital of the Ministry of Health, and King Fahd General Hospital is the largest government hospital that renders medical services in most major specialties and subspecialties.

The target population consisted of a convenience sample of women (patients, caregivers, and visitors), aged 15-70 years. All participants gave their consent to participate after the nature of the study had been fully explained. Approval to conduct the study was obtained from the Biomedical Ethics Research Committee of King Abdulaziz University.

We included 2301 women from the outpatient and inpatient departments of the above-mentioned hospitals. Of these, 2072 respondents completed the questionnaire, representing an overall response rate of 90.0%. Non-responders, including women who provided partial or incomplete information, comprised 10.0% of the sample population (n = 229). A follow-up study of non-responders was not performed, as the survey was conducted in a public place.

The purpose of the research was explained by a psychologist and a professional health assistant to all the participants, who were then asked to fill a 50-item questionnaire that comprised questions to identify ever exposure to DV. Special assistance was provided to the illiterate and in cases where further explanation was necessary.

Instrument

We used a questionnaire that was created based on questions from three questionnaires, namely the NorVold Domestic Abuse Questionnaire, the Pregnancy Risk Assessment Monitoring System (PRAMS), and the Kansas Marital Satisfaction Scale.[8-10]

Items Assessed

The questionnaire comprised six sections: (1) the personal data of the couple, including their educational attainment, employment status, and their annual household incomes; (2) items that covered physical, psychological and sexual abuse; (3) help-seeking options of abused women; (4) the damaging effect of violence on the victims; (5) items to score the level of happiness, extracted from the Kansas Marital Satisfaction Scale;¹⁰ and (6) items to evaluate the effect of violence on pregnancy and its outcome, extracted from the PRAMS.[9] The questionnaire was translated into Arabic, and it was revised by experts for accuracy, clarity, and understanding.

In order to describe the mode of living of the participants, we took into consideration the kind of house they rented or owned. Participants were categorized into four groups: (1) lived in rented apartments, (2) lived in self-owned apartments, (3) lived in rented villas,

and (4) lived in self-owned villas. The monthly income of the husband was classified into low (1000-3000 SAR per month), middle (>3000-5000 SAR per month), and high (> 5000 SAR per month).

Physical violence was defined as having ever been pushed, beaten, slapped, kicked, hit with a fist or object, pulled by the hair, dragged, burned, or threatened or attacked with a knife or gun by a spouse or family member. Psychological abuse was defined as having ever been threatened by a spouse or family member, prevented from visiting or calling family members and friends, or insulted. Sexual violence was defined as having ever been forced by a spouse or family member to have unwanted intercourse.

Statistical analysis

Data analysis was performed using the Statistical Package for the Social Sciences (SPSS Inc., Chicago, IL, USA), version 18. We used the independent t-test for equal variance and Welch’s t-test for unequal variance. Chi square test was used to determine the association between variables. P <.05 was considered statistically significant.

RESULTS

A total of 2301 women participated in the survey, representing a response rate of 81%. Saudi women comprised 58.3% of the sample (n=1342), while expatriate women made up 41.7% of the population (n=959). The mean ± SD age of the women was 34.4 ± 10.9 years.

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3 Married women constituted 65.9% of the study population (n=1516); 607 women
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5 (26.4%) were divorced, 58 (2.5%) were widowed, 36 (1.6%) were single; 84 women
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7 (3.8%) did not disclose their marital status. Based on marital status, 67.3% of the
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9 women who reported abuse were married (n=509); 28.4% of abused women were
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11 divorced, 2.9% were widows (n=22), while 1.3% were single (n=10).
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16 Further analysis showed that women with a higher educational status and those who
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18 were financial dependent were significantly more likely to report abuse ($p<.001$ and $p=$
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.003, respectively; Table 1).

Table 1. Characteristics of the Abused and Non-abused Women^a

	Non-abused	Abused	Total ^b	P-value
Number of children	3.67 ± 2.38	4.06 ± 2.59	-	.001
Number of treated cycles	2.63 ± 4.31	2.51 ± 3.81	-	.768
Number of children in the women's families	7.10 ± 3.57	7.33 ± 3.53	-	.145
Mode of Living				
Rented apartment	754 (51.2)	418 (55.1)	1172 (52.5)	.196
Owned apartment	545 (37.0)	270 (35.6)	815 (36.5)	
Rented Villa	61 (4.1)	28 (3.7)	89 (4.0)	
Owned Villa	112 (7.6)	43 (5.7)	155 (6.9)	
Total	1472 (66.0)	759 (34.0)	2231 (100.0)	
Educational Attainment				
Illiterate	118 (8.3)	71 (9.9)	189 (8.9)	<.0001
Primary	179 (12.6)	125 (17.5)	304 (14.2)	
Secondary	493 (34.7)	266 (37.2)	759 (35.6)	
College	629 (44.3)	253 (35.4)	882 (41.3)	
Total	1419 (66.5)	715 (33.5)	2134 (100.0)	

Employment Status

Unemployed	1072 (75.7)	571 (77.6)	1643 (76.3)	.331
Employed	344 (24.3)	165 (22.4)	509 (23.7)	
Total	1416 (65.8)	736 (34.2)	2152 (100.0)	

Financially Dependent

Yes	1129 (77.4)	542 (71.8)	1671 (75.5)	.003
No	329 (22.6)	213 (28.2)	542 (24.5)	
Total	1458 (65.9)	755 (34.1)	2213 (100.0)	

^aData are presented as frequency (percent) unless otherwise specified.

^bThe total corresponds to the number of participants who responded to the questions in the individual sections.

Table 2 shows that the spouses of women who reported DV were significantly older than those of non-abused women ($p < .0001$). Participants who reported DV were also likely to report that their spouses had completed at least primary or secondary education ($p < .0001$).

Women who reported abuse were more likely to also report that their male partner was a smoker ($P < .0001$). Conversely, a significantly lower proportion of abused women reported their male partners were alcohol users ($p = 0.001$).

Table 2. Characteristics of the Spouses of Abused and Non-abused Women^a

Characteristic	Non-abused	Abused	Total ^b	P-value
Husband's Age (mean ± SD in years)	41.2 ± 11.9	43.2 ± 12.3	-	<.0001
Husband's Educational Attainment				
Illiterate	87 (6.4)	77 (10.7)	164 (7.9)	<.0001
Primary	339 (24.8)	218 (30.3)	557 (26.7)	
Secondary	449 (32.8)	217 (30.1)	666 (31.9)	
College	463 (33.8)	189 (26.3)	652 (31.2)	
Masters	31 (2.3)	19 (2.6)	50 (2.4)	
Total	1369 (65.5)	720 (34.5)	2089 (100.0)	
Husband's Average Income (in Saudi Arabian Riyals)				
1000-3000	644 (46.0)	322 (48.1)	966 (46.7)	.219
>3000-5000	317 (22.7)	148 (22.1)	465 (22.5)	
>5000-10000	254 (18.8)	135 (20.2)	399 (19.3)	
>10000	176 (12.6)	64 (9.6)	240 (11.6)	
Total	1401 (67.7)	669 (32.3)	2070 (100.0)	
Smoker				
Yes	419 (66.1)	300 (78.5)	719 (70.8)	<.0001
No	215 (33.9)	82 (21.5)	297 (29.2)	
Total	634 (62.4)	382 (37.6)	1016 (100.0)	
Consumes alcohol				
Yes	23 (18.1)	25 (41.0)	48 (25.5)	.001

No	104 (81.9)	36 (59.0)	140 (74.5)	
Total	127 (67.6)	61 (32.4)	188 (100.0)	
Drug user				
Yes	14 (2.7)	6 (2.5)	20 (2.6)	
No	505 (97.3)	232 (97.5)	737 (97.4)	.888
Total	519 (68.5)	238 (31.4)	757 (100.0)	

^aData are presented as frequency (percent) unless otherwise specified.

^bThe total corresponds to the number of participants who responded to the questions in the individual sections.

DISCUSSION

We explored the characteristics of a convenience sample of women who visited three tertiary hospitals in Jeddah with the aim of identifying the factors that were associated with DV. The characteristics analyzed were sociodemographic (age, marital status, educational attainment, employment status, economic autonomy) and behavioral (spousal alcohol, cigarette, and drug use).

Our analysis shows that factors, such as high educational attainment, unemployment, and financial dependence are significantly associated with DV, with women of higher educational status and lower economic autonomy being more likely to report abuse. Our finding of a positive association between DV and women's education is contrary to those of other authors who reported DV to be more common among women with a lower level of education.[11, 12] This disparity might be attributed to differences in

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culture between the studied populations, and ‘traditional’ masculinity,[13] such as controlling a woman’s behavior might explain why educated women were more abused in our study. More so, in a city such as Jeddah, which is known to have a diversified population with people of different ethnic backgrounds, it is possible that with the changing norms, women are increasingly deviating from the traditional roles, embracing different cultural habits and challenging the prevailing gender order. Patriarchal beliefs and the associated practice of dowry, illiteracy, lack of wealth, and younger age at marriage, which have been described as the sources of acceptance of violence on the part of women,[14] are slowly fading away. In the Saudi society where men are traditionally known as the heads of households, it is difficult for some men to accept these behavioral changes, and in an effort to control their female partners’ behavior, they tend to abuse them physically, psychologically, or sexually.

The ability for a woman to leave her abusive male partner also depends on her economic autonomy.[15] In societies where a woman can live on her own, a woman may be more inclined to stay with an abusive partner when she does not have the means to afford housing. However, this may not apply to the Saudi society where a woman cannot live on her own and is obliged to live with her relatives if she is single or divorced or with her husband if she is married.

Findings from a community and clinical study indicated that among the demographic factors that were determinants of DV, the more children a woman had, the less likely was she to be beaten by her partner.[16, 17] On the contrary, our analyses showed that abused women were more likely to have more children than their non-abused peers.

Women who reported DV were likely to report that their spouses had completed at least primary or secondary education ($p<.0001$); however, we did not find a significant association between spousal income and DV. Previous analyses of community samples have shown that that low-socio economic status,[18-20] and low educational status were significant predictors of DV.[4, 18, 20, 21] In addition, other studies have found that indicators of household economic prosperity and education of the male partner were inversely associated with the risk of DV.[16, 22]

Contrary to Caetano et al's [23] report that partner violence is less likely as men age, we found that the spouses of abused women were significantly older than those of non-abused women. However, it is uncertain whether our finding is affected by the age difference between partners, which could set up an unequal balance of power. Findings from another study indicated that having a partner of the same age or younger was a risk factor for intimate partner violence (after controlling for factors, such as acceptance of violence, younger age, and age difference between partners).[24]

In our study, women who reported abuse were likely to report that their male partner was a smoker ($P<.0001$); a significantly lower proportion of abused women reported their male partners were alcohol users ($p=.001$). Findings suggest a link between cigarette smoking and alcohol use in perpetrators of DV. In one study, the authors found that daily smokers had significantly more days of alcohol use prior to starting substance abuse treatment compared to non-daily smoking alcohol dependent offenders of IPV.[25] Other authors reported that DV was associated with higher rates of drunkenness.[3, 26] A similar association was reported between drug abuse and DV.[27]

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This study is the first to assess risk factors associated with DV among women in a Saudi society. However, our study has some limitations. Only women were surveyed, and the data relied solely on the reports of the participants. Moreover, we recruited a convenience sample of women owing to the difficulties in approaching leaders of women’s gathering groups, who were hesitant to give their approval because of the relatively sensitive nature of our theme. We did not also report factors such as the gender, race and ethnicity of the psychologist and health assistant who were present during data collection. These factors would have been important to consider when estimating the reliability and validity of our questionnaire. A further limitation is that some women did not respond to certain questions for fear of disclosing too much personal information. Given that different types of addiction are not as rare as they used to be in Saudi Arabia and drug use is a crime punishable by death,[28] it is possible that drug abuse may have been under-reported in this study. Similarly, alcohol consumption may have been under-reported since its production, importation, and consumption are completely banned by the Saudi government.[29]

The multi-faceted nature of the factors associated with DV against women in this study highlights the need to design effective DV prevention programs. This may involve educating the population on changing gender norms and addressing issues of abuse through developing social service programs.

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STROBE Statement—checklist of items that should be included in reports of observational studies

	Item No	Recommendation
Title and abstract	1	(a) Indicate the study's design with a commonly used term in the title or the abstract (b) Provide in the abstract an informative and balanced summary of what was done and what was found
Introduction		
Background/rationale	2	Explain the scientific background and rationale for the investigation being reported
Objectives	3	State specific objectives, including any prespecified hypotheses
Methods		
Study design	4	Present key elements of study design early in the paper
Setting	5	Describe the setting, locations, and relevant dates, including periods of recruitment, exposure, follow-up, and data collection
Participants	6	(a) <i>Cohort study</i> —Give the eligibility criteria, and the sources and methods of selection of participants. Describe methods of follow-up <i>Case-control study</i> —Give the eligibility criteria, and the sources and methods of case ascertainment and control selection. Give the rationale for the choice of cases and controls <i>Cross-sectional study</i> —Give the eligibility criteria, and the sources and methods of selection of participants (b) <i>Cohort study</i> —For matched studies, give matching criteria and number of exposed and unexposed <i>Case-control study</i> —For matched studies, give matching criteria and the number of controls per case
Variables	7	Clearly define all outcomes, exposures, predictors, potential confounders, and effect modifiers. Give diagnostic criteria, if applicable
Data sources/ measurement	8*	For each variable of interest, give sources of data and details of methods of assessment (measurement). Describe comparability of assessment methods if there is more than one group
Bias	9	Describe any efforts to address potential sources of bias
Study size	10	Explain how the study size was arrived at
Quantitative variables	11	Explain how quantitative variables were handled in the analyses. If applicable, describe which groupings were chosen and why
Statistical methods	12	(a) Describe all statistical methods, including those used to control for confounding (b) Describe any methods used to examine subgroups and interactions (c) Explain how missing data were addressed (d) <i>Cohort study</i> —If applicable, explain how loss to follow-up was addressed <i>Case-control study</i> —If applicable, explain how matching of cases and controls was addressed <i>Cross-sectional study</i> —If applicable, describe analytical methods taking account of sampling strategy (e) Describe any sensitivity analyses

Continued on next page

Results

Participants	13*	(a) Report numbers of individuals at each stage of study—eg numbers potentially eligible, examined for eligibility, confirmed eligible, included in the study, completing follow-up, and analysed (b) Give reasons for non-participation at each stage (c) Consider use of a flow diagram
Descriptive data	14*	(a) Give characteristics of study participants (eg demographic, clinical, social) and information on exposures and potential confounders (b) Indicate number of participants with missing data for each variable of interest (c) Cohort study—Summarise follow-up time (eg, average and total amount)
Outcome data	15*	Cohort study—Report numbers of outcome events or summary measures over time Case-control study—Report numbers in each exposure category, or summary measures of exposure Cross-sectional study—Report numbers of outcome events or summary measures
Main results	16	(a) Give unadjusted estimates and, if applicable, confounder-adjusted estimates and their precision (eg, 95% confidence interval). Make clear which confounders were adjusted for and why they were included (b) Report category boundaries when continuous variables were categorized (c) If relevant, consider translating estimates of relative risk into absolute risk for a meaningful time period
Other analyses	17	Report other analyses done—eg analyses of subgroups and interactions, and sensitivity analyses

Discussion

Key results	18	Summarise key results with reference to study objectives
Limitations	19	Discuss limitations of the study, taking into account sources of potential bias or imprecision. Discuss both direction and magnitude of any potential bias
Interpretation	20	Give a cautious overall interpretation of results considering objectives, limitations, multiplicity of analyses, results from similar studies, and other relevant evidence
Generalisability	21	Discuss the generalisability (external validity) of the study results

Other information

Funding	22	Give the source of funding and the role of the funders for the present study and, if applicable, for the original study on which the present article is based
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*Give information separately for cases and controls in case-control studies and, if applicable, for exposed and unexposed groups in cohort and cross-sectional studies.

Note: An Explanation and Elaboration article discusses each checklist item and gives methodological background and published examples of transparent reporting. The STROBE checklist is best used in conjunction with this article (freely available on the Web sites of PLoS Medicine at <http://www.plosmedicine.org/>, Annals of Internal Medicine at <http://www.annals.org/>, and Epidemiology at <http://www.epidem.com/>). Information on the STROBE Initiative is available at www.strobe-statement.org.



Factors Associated With Domestic Violence: A Cross-sectional Survey Among Women in Jeddah

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Factors Associated With Domestic Violence: A Cross-sectional Survey Among Women in Jeddah

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Abstract

Objective: This study aims to identify the factors associated with domestic violence (DV) among women in Jeddah.

Design: Cross-sectional survey.

Setting: Outpatient departments of three tertiary hospitals in Jeddah.

Participants: Convenience sample of women at the outpatient and inpatient clinics, aged 15-70 years.

Interventions: Between December 15, 2011 and May 30, 2012, a psychologist and a professional health assistant explained the purpose of the research to participants, who were then asked to fill a 50-item questionnaire. The questionnaire was created based on questions from three questionnaires: the NorVold Domestic Abuse Questionnaire, the Pregnancy Risk Assessment Monitoring System, and the Kansas Marital Satisfaction Scale. The questionnaire was used to assess the association between DV and family status, male partner attitudes, age, educational attainment, employment, financial, and socio-economic status.

Results: A total of 2301 women participated in the survey (81% response rate). The mean \pm SD age of the participants was 34.4 ± 10.9 years. The lifetime prevalence of DV was 34.0%. Abused women had more children than non-abused women ($P=.001$), and their spouses were significantly older than those of non-abused women ($p < .0001$). Financially-dependent women and those with a high educational status were significantly more likely to report abuse ($p = .003$ and $p < .001$, respectively). Abused

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women were also likely to report that their spouse was a smoker ($P<.0001$) and had completed at least primary or secondary education ($p<.0001$). A significantly lower proportion of abused women reported that their male partners were alcohol users ($p=0.001$). The results of logistic regression showed that women who were financially-dependent had about 1.5-fold odds of being physically abused by a spouse.

Conclusions: Many factors are associated with DV against women, hence highlighting the need to design effective DV prevention programs.

Article Summary

Article focus:

- The aim of this study was to identify the factors associated with domestic violence (DV) among women.

Key messages:

- Domestic violence is an important health problem in Jeddah.
- Identifying the factors associated with domestic violence is an important step toward designing effective domestic violence prevention programs.

Strengths and limitations of this study:

- The cross-sectional nature of our study prohibits conclusions about causality, predictive ability, and labeling variables as risk factors.
- Only women were surveyed, and the data relied solely on the reports of the participants.
- We recruited a convenience sample of women owing to the difficulties in approaching leaders of women's gathering groups, who were hesitant to give their approval because of the relatively sensitive nature of our theme.
- We did not report factors such as the gender, race and ethnicity of the psychologist and health assistant who were present during data collection. These

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factors would have been important to consider when estimating the reliability and validity of our questionnaire.

- Some women did not respond to certain questions for fear of disclosing too much personal information.
- The potential impact on the self-report of women who needed assistance in completing their questionnaires should also be taken into consideration, as sensitive information was obtained.

INTRODUCTION

Domestic violence (DV) is a common problem that affects men and women worldwide. It was a formerly neglected public health problem, which has gained more visibility over the past few decades. Since its recognition as a serious human rights abuse and important public health problem at key international conferences during the 1990s, including the Fourth World Conference on Women,[1] researchers have shown the increasing prevalence of violence perpetrated on women by their male partners. It was estimated that between 10% and 52% of women from 35 countries worldwide reported they had been physically abused by an intimate partner at some point in their lives, and approximately 10-30% reported they had experienced sexual violence by an intimate male partner.[2, 3]

In the Middle East, there is a paucity of studies on DV although there is a growing body of evidence highlighting the magnitude of this problem among women in developing countries.[4] Findings from previous studies conducted in Egypt, Israel, Palestine, and Tunisia indicate that at least one out of three women was a victim of DV.[4, 5] According to results from two demographic health surveys conducted ten years apart (in 1995 and 2005) in Egypt, beating by an intimate partner was highly prevalent despite increasing levels of education and was not limited to selected risk groups.[6]

Until quite recently, DV was a hidden problem in Saudi Arabia. Only few studies have reported the prevalence of DV among women in three different regions of Saudi Arabia, with prevalence rates ranging from 39.3% to as high as 57.7%.[7, 8] This high prevalence is compounded by cultural norms, which prevent women from reporting

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cases of abuse for fear of social stigma. In their study, Tashkandi et al [7] found that 25.7% of ever-married women attending primary health centers in Medina reported physical abuse; emotional abuse without physical violence was reported in 32.8% of the cases. Of those physically abused, 36.7% and 63.3% suffered minor and severe incidents, respectively. Affif et al,[8] in a community based-study conducted in Al-Ahsa oasis in the Eastern Province of Saudi Arabia, found that 29.1% of the women reported mental abuse, while 22.8% and 11.8% reported physical and sexual abuse, respectively. However, none of these studies identified the factors associated with DV, which is an important step toward designing effective DV prevention programs. This study was designed to identify the factors, such as the woman's educational status,[9, 10] occupation,[9, 11] age,[10, 12, 13] socioeconomic status,[9, 14] alcohol have been reported to be significantly associated with spousal abuse.

METHODS

Participants

A cross-sectional survey was performed between December 15, 2011 to March 30, 2012 at three tertiary hospitals in Jeddah, namely King Abdulaziz University Hospital, King Abdulaziz Oncology Medical Center, and King Fahd General Hospital. King Abdulaziz University Hospital was the first university hospital, created in 1956. King Abdulaziz Oncology Medical Center is the largest hospital of the Ministry of Health, and King Fahd General Hospital is the largest government hospital that renders medical services in most major specialties and subspecialties.

The target population consisted of a convenience sample of ever-married women (patients, caregivers, and visitors), aged 15-70 years. Marriages among young women younger than 20 years is uncommon in Saudi Arabia [16], and abuse among women aged above 50 years has not been explored in previous studies conducted in the Kingdom [7, 8]. We excluded all single women and those aged <15 or > 70 years. All participants gave their consent to participate after the nature of the study had been fully explained. Approval to conduct the study was obtained from the Biomedical Ethics Research Committee of King Abdulaziz University.

We included 2301 women from the outpatient and inpatient departments of the above-mentioned hospitals. Of these, 2072 respondents completed the questionnaire, representing an overall response rate of 90.0%. Non-responders, including women who provided partial or incomplete information, comprised 10.0% of the sample population (n

= 229). A follow-up study of non-responders was not performed, as the survey was conducted in a public place.

The purpose of the research was explained by a psychologist and a professional health assistant to all the participants, who were then asked to fill a 50-item questionnaire that comprised questions to identify ever exposure to DV. Special assistance was provided to the illiterate and in cases where further explanation was necessary. The women were requested to fill the questionnaire in a private room that was reserved for this purpose. Participants were guaranteed confidentiality of their responses; they were assured that there would be no specific reference to individuals, but the findings and conclusions will be stated in general terms.

Instrument

We used a questionnaire that was created based on questions from three questionnaires, namely the NorVold Domestic Abuse Questionnaire, the Pregnancy Risk Assessment Monitoring System (PRAMS), and the Kansas Marital Satisfaction Scale.[17-19]

Items Assessed

The questionnaire comprised six sections: (1) the personal data of the couple, including their educational attainment, employment status, and their annual household incomes; (2) items that covered physical, psychological and sexual abuse; (3) help-seeking options of abused women; (4) the damaging effect of violence on the victims; (5) items to score the level of happiness, extracted from the Kansas Marital Satisfaction

Scale;^[18] and (6) items to evaluate the effect of violence on pregnancy and its outcome, extracted from the PRAMS.^[18] The questionnaire was translated into Arabic, and it was revised by experts for accuracy, clarity, and understanding.

In order to describe the mode of living of the participants, we took into consideration the kind of house they rented or owned. Participants were categorized into four groups: (1) lived in rented apartments, (2) lived in self-owned apartments, (3) lived in rented villas, and (4) lived in self-owned villas. The monthly income of the husband was classified into low (1000-3000 SAR per month), middle (>3000-5000 SAR per month), and high (> 5000 SAR per month).

Physical violence was defined as having ever been pushed, beaten, slapped, kicked, hit with a fist or object, pulled by the hair, dragged, burned, or threatened or attacked with a knife or gun by a spouse or family member. Psychological abuse was defined as having ever been threatened by a spouse or family member, prevented from visiting or calling family members and friends, or insulted. Sexual violence was defined as having ever been forced by a spouse or family member to have unwanted intercourse.

We classified marital satisfaction into extremely dissatisfied, very dissatisfied, somewhat dissatisfied, mixed feelings, somewhat satisfied, very satisfied, and extremely satisfied.

Statistical analysis

Data analysis was performed using the Statistical Package for the Social Sciences (SPSS Inc., Chicago, IL, USA), version 18. We used the independent t-test for equal variance and Welch's t-test for unequal variance. Chi square test was used to determine the association between variables. A logistic regression model was used to predict the

odds of being abused. $P < .05$ was considered statistically significant (95% confidence interval).

Cronbach's alpha was used to test the internal consistency of items that attempted to assess marital satisfaction. If Cronbach's alpha was $> .70$, then the ratio scale was considered reliable.

RESULTS

A total of 2301 women participated in the survey, representing a response rate of 81%. Saudi women comprised 58.3% of the sample ($n=1342$), while expatriate women made up 41.7% of the population ($n=959$). The mean \pm SD age of the women was 34.4 ± 10.9 years. Married women constituted 65.9% of the study population ($n=1516$); 607 women (26.4%) were divorced, 58 (2.5%) were widowed, 36 (1.6%) were single; 84 women (3.8%) did not disclose their marital status.

The lifetime prevalence of DV in our cohort was 34.0%: emotional abuse, 29.0%; physical abuse, 11.6%; and sexual abuse, 4.8%. Based on marital status, 67.3% of the women who reported abuse were married ($n=509$); 28.4% of abused women were divorced, 2.9% were widows ($n=22$), while 1.3% were separated ($n=10$).

Further analysis showed that illiterate women and those who had completed primary education were significantly more likely to report abuse ($p < .0001$; Table 1). Women who were financially dependent on their spouses were also significantly more likely to report

abuse ($p = .003$). Spousal abuse was more frequent in the group of women aged > 50 years, but this difference did not reach statistical significance.

For peer review only

Table 1. Characteristics of the Abused and Non-abused Women^a

	Non-abused	Abused	Total ^b	P-value
Number of children	3.67 ± 2.38	4.06 ± 2.59	-	.001
Clomiphene-treated cycles (n)	2.63 ± 4.31	2.51 ± 3.81	-	.768
Number of children in the women's families	7.10 ± 3.57	7.33 ± 3.53	-	.145
Age (years)^c				
< 20	44 (65.7)	23 (34.3)	67 (100.0)	.829
21-30	556 (67.5)	268 (32.5)	824 (100.0)	
31-40	553 (65.6)	290 (34.4)	843 (100.0)	
41-50	320 (64.4)	175 (35.6)	495 (100.0)	
> 50	25 (62.5)	15 (37.5)	40 (100.0)	
Total	1498 (66.0)	771 (34.0)	2269 (100.0)	
Mode of Living				
Rented apartment	754 (64.3)	418 (35.7)	1172 (100.0)	.196
Owned apartment	545 (66.9)	270 (33.1)	815 (100.0)	
Rented Villa	61 (68.5)	28 (31.5)	89 (100.0)	
Owned Villa	112 (72.3)	43 (27.7)	155 (100.0)	

Total	1472 (66.0)	759 (34.0)	2231 (100.0)	
Educational Attainment				
Illiterate	118 (62.4)	71 (37.6)	189 (100.0)	
Primary	179 (58.9)	125 (41.1)	304 (100.0)	<.0001
Secondary	493 (65.0)	266 (35.0)	759 (100.0)	
College	629 (71.3)	253 (28.7)	882 (100.0)	
Total	1419 (66.5)	715 (33.5)	2134 (100.0)	
Employment Status				
Unemployed	1072 (65.2)	571 (34.8)	1643 (100.0)	.331
Employed	344 (67.6)	165 (32.4)	509 (100.0)	
Total	1416 (65.8)	736 (34.2)	2152 (100.0)	
Financially Dependent				
Yes	1129 (67.6)	542 (32.4)	1671 (100.0)	.003
No	329 (60.7)	213 (39.3)	542 (100.0)	
Total	1458 (65.9)	755 (34.1)	2213 (100.0)	

^aData are presented as frequency (percent) unless otherwise specified.

^bThe total corresponds to the number of participants who responded to the questions in the individual sections.

^cWomen aged 15-70 years were included.

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The spouses of women who reported DV were significantly older than those of non-abused women ($p < .0001$; Table 2). Participants who reported DV were likely to report that their spouses had completed at least primary or secondary education ($p < .0001$). They were more likely to also report that their male partner was a smoker ($P < .0001$). Conversely, a significantly lower proportion of abused women reported their male partners were alcohol users ($p = 0.001$).

Table 2. Characteristics of the Spouses of Abused and Non-abused Women^a

Characteristic	Non-abused	Abused	Total ^b	P-value
Husband's Age (mean ± SD in years)	41.2 ± 11.9	43.2 ± 12.3	-	<.0001
Husband's Educational Attainment				
Illiterate	87 (53.0)	77 (47.0)	164 (100.0)	<.0001
Primary	339 (60.9)	218 (39.1)	557 (100.0)	
Secondary	449 (67.4)	217 (32.6)	666 (100.0)	
College	463 (71.0)	189 (29.0)	652 (100.0)	
Masters	31 (62.0)	19 (38.0)	50 (100.0)	
Total	1369 (65.5)	720 (34.5)	2089 (100.0)	
Husband's Average Income (in Saudi Arabian Riyals)				
1000-3000	644 (66.6)	322 (33.4)	966 (100.0)	.219
>3000-5000	317 (68.2)	148 (31.8)	465 (100.0)	
>5000-10000	254 (63.7)	135 (36.3)	399 (100.0)	
>10000	176 (73.3)	64 (26.7)	240 (100.0)	
Total	1401 (67.7)	669 (32.3)	2070 (100.0)	
Smoker				
Yes	419 (58.3)	300 (41.7)	719 (100.0)	<.0001
No	215 (72.4)	82 (27.6)	297 (100.0)	
Total	634 (62.4)	382 (37.6)	1016 (100.0)	
Consumes alcohol				
Yes	23 (47.9)	25 (52.1)	48 (100.0)	.001

No	104 (74.3)	36 (25.7)	140 (100.0)	
Total	127 (67.6)	61 (32.4)	188 (100.0)	
Drug user				
Yes	14 (70.0)	6 (30.0)	20 (100.0)	
No	505 (68.5)	232 (31.5)	737 (100.0)	.888
Total	519 (68.5)	238 (31.4)	757 (100.0)	

^aData are presented as frequency (percent) unless otherwise specified.

^bThe total corresponds to the number of participants who responded to the questions in the individual sections.

The results of logistic regression showed that women who were financially-dependent had about 1.5-fold odds of being physically abused by a spouse. Women whose spouses had completed at least primary education had twice the odds of being abused; the odds were also higher in women who had completed primary education. However, these results did not reach statistical significance.

Table 3. Binary logistic regression analysis of factors associated with domestic violence

Variables	Odds ratio	P-value
Number of children	1.019	.547
Husband's age	.999	.882
Number of abortions	1.055	.270
Woman's educational Attainment		.244
Illiterate	1.172	.575
Primary education	1.487	.084
Secondary education	1.327	.095
Financially dependent on husband	1.572	.001
Husband's educational attainment		.034
Primary education	2.102	.146
Secondary education	1.060	.900
College graduate	1.136	.781
Master's	.825	.674

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Abused women were significantly more likely to report body self-hatred, food addiction, and hopelessness (Table 4). On the contrary, gastro-intestinal disorders and loss of trust in others were significantly more frequently reported in the non-abused group.

Gynecological disorders, including abortions, metrorrhagia, and menorrhagia were significantly more reported in the abused group (Table 4). Victims of DV were also more likely to report having less weight gain during pregnancy and babies with lower birth weights, but these results did not reach statistical significance.

Table 4. Common mental, medical, and gynecological and obstetrical problems reported by the respondents^a

	Non-Abused	Abused	P-value
Weight gain in pregnancy (kg)	13.85 ± 14.96	13.56 ± 14.86	.696
Babies' average birth weight (kg)	3.02 ± 1.52	2.99 ± 1.61	.689
Number of abortions	1.02 ± 1.24	1.25 ± 1.68	.006
Metrorrhagia	370 (57.2)	277 (42.8)	< .0001
Menorrhagia	244 (54.8)	201 (45.2)	< .0001
Loss of trust in others			
Yes	290 (56.1)	227 (43.9)	< .0001
No	1144 (69.6)	500 (30.4)	
Body self-hatred			
Yes	80 (49.4)	82 (50.6)	< .0001
No	1349 (67.7)	644 (32.3)	
Food addiction			
Yes	102 (46.2)	119 (53.8)	< .0001
No	1330 (68.7)	607 (31.3)	

Irritable colon or gastric ulcer			
Yes	219 (51.2)	209 (48.8)	< .0001
No	1202 (59.3)	517 (40.7)	
Self-perception as hopeless a person			
Yes	69 (41.2)	96 (58.8)	< .0001
No	1355 (68.2)	632 (31.8)	

^aData are presented as frequency (percent) unless otherwise specified.

Although a large proportion of women reported being satisfied to extremely satisfied in their marriages, abused women were significantly more likely to report being unsatisfied or extremely unsatisfied in their marriages (Cronbach's Alpha = .931; Table 5).

Table 5. Marital satisfaction scale demonstrating the women's level of satisfaction in their marriages^a

	Physically abused ^b		Sexually abused ^b		Emotionally abused ^b		Ever abused ^b	
	No	Yes	No	Yes	No	Yes	No	Yes
Extremely dissatisfied								
	24 (1.3)	19 (7.1)	34 (1.6)	9 (8.2)	17 (1.1)	26 (3.9)	16 (1.1)	27 (3.7)
Very dissatisfied								
	25 (1.3)	14 (5.2)	32 (1.6)	7 (6.4)	15 (1.0)	24 (3.6)	15 (1.0)	24 (3.3)
Somewhat dissatisfied								
	29 (1.5)	22 (8.2)	40 (1.9)	11(10.0)	14 (0.9)	37 (5.5)	11 (0.8)	40 (5.4)
Mixed								
	236 (12.4)	76 (28.3)	279 (13.5)	33 (30.0)	180 (12)	132 (19.6)	170 (11.8)	142 (19.3)
Somewhat satisfied								
	627 (33.0)	68 (25.3)	676 (32.8)	19 (17.3)	456 (30.5)	239 (35.5)	436 (30.3)	259 (35.3)
Very satisfied								
	655 (34.4)	45 (16.7)	681 (33.0)	19 (17.3)	557 (37.2)	143 (21.2)	537 (37.4)	163 (22.2)
Extremely satisfied								
	306 (16.1)	25 (9.3)	319 (15.5)	12 (10.9)	258 (17.2)	73 (10.8)	252 (17.5)	79 (10.8)
Total	1902 (82.7)	269 (11.7)	2061 (89.6)	110 (4.8)	1497 (65.1)	674 (29.3)	1437 (62.5)	734 (31.9)

^aData are presented as frequency (percent).

^bP-value ≤ 0.0001.

A small proportion of abused women sought help from their families (n=72, 3.1%) or their husbands' families (n=73, 3.2%). Only 56 women (2.4%) planned to see a psychiatrist, while 24 (1.0%) planned to contact social services.

DISCUSSION

This is the first study to explore the factors associated with DV in a large cohort of women in Jeddah, Saudi Arabia. The characteristics analyzed were sociodemographic (age, marital status, educational attainment, employment status, economic autonomy) and behavioral (spousal alcohol, cigarette, and drug use). Although expatriate women comprised nearly half of the sample, all the women were subject to the same threat, as there are limited consequences for perpetrators of DV in a society that is primarily ultraconservative. This allowed us to combine native Saudi and expatriate women.

Our analysis supports the view that women who are unemployed or financially dependent on their spouses may be more likely to experience DV. In particular, financial dependence was associated with approximately 1.5-fold odds of spousal abuse, after controlling other factors, such as age, educational attainment, and the number of children. While economic factors are usually implicated in DV,[20, 21] some authors reported that employment status and relative earnings were not predictive of DV.[22] According to one report, the ability of a woman to leave her abusive male partner was also dependent on her economic autonomy.[20] In societies where a woman can live on her own, a woman may be more inclined to stay with an abusive partner when she does not have the means to afford housing. However, this may not apply to the Saudi society

where a woman cannot live on her own and is obliged to live with her relatives if she is single or divorced or with her husband if she is married.

Women of lower educational status were significantly more likely to report abuse, which is in line with those of other authors [10] who reported DV to be more common among women with a lower level of education. In their report, the authors found that women with secondary or higher levels of education were significantly less likely to experience violence than women with less than five years of education. In another report, the authors found that a reduction in DV risk was associated with secondary education for both the woman and her partner, there was less consistent evidence of a protective effect of primary education.[21]

Women who reported DV were likely to report that their spouses had completed at least primary or secondary education ($p < .0001$); however, we did not find a significant association between spousal income and DV. Previous analyses of community samples have shown that that low-socio economic status,[23-25] and low educational status were significant predictors of DV.[4, 23, 25, 26] In addition, other studies have found that indicators of household economic prosperity and education of the male partner were inversely associated with the risk of DV.[27, 28]

Findings from a community and clinical study indicated that among the demographic factors that were determinants of DV, the more children a woman had, the less likely was she to be beaten by her partner.[27, 29] On the contrary, our analyses showed that abused women were more likely to have more children than their non-abused peers.

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Contrary to Caetano et al's [30] report that partner violence is less likely as men age, we found that the spouses of abused women were significantly older than those of non-abused women. However, it is uncertain whether our finding is affected by the age difference between partners, which could set up an unequal balance of power. Findings from another study indicated that having a partner of the same age or younger was a risk factor for intimate partner violence (after controlling for factors, such as acceptance of violence, younger age, and age difference between partners).[31]

In our study, women who reported abuse were likely to report that their male partner was a smoker ($P<.0001$); a significantly lower proportion of abused women reported their male partners were alcohol users ($p=.001$). Findings suggest a link between cigarette smoking and alcohol use in perpetrators of DV. In one study, the authors found that daily smokers had significantly more days of alcohol use prior to starting substance abuse treatment compared to non-daily smoking alcohol dependent offenders of IPV.[31] Other authors reported that DV was associated with higher rates of drunkenness.[3, 33] A similar association was reported between drug abuse and DV.[34]

Several studies have reported a range of mental and physical health disorders in women victims of DV.[35-38] While other authors [37] have cited physical disabilities suicidal thoughts and suicidal attempts to be common among victims of DV, others have reported cases of abruptio placenta, preterm labor, and kidney infections in women who were physically abused.[35] In our study, abused women were more likely to report body self-hatred, food addiction, hopelessness, and gynecological disorders such as metrorrhagia and menorrhagia. Although there is no clear explanation to our findings,

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3 we believe that emotional abuse, which was the common form of abuse in our sample,
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5 might have led to negative health perceptions.[39]
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9 Our findings demonstrated that abused women were more likely to report dissatisfaction
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11 in their marriages. In addition, less than 5% sought help or planned to seek assistance
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13 from social services probably because they are poorly developed in Saudi Arabia.[39,
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15 40] It is plausible that women justified violence,[42-44] which made it difficult for them to
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17 leave their spouses or report DV. In addition, religious justification from the Qu'ran is
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19 usually cited for wife abuse in Muslim communities;[40, 45] however, this view was not
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21 explored, as it was not the focus of our study.
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26 This study is the first to assess risk factors associated with DV among women in a
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28 Saudi society. However, our study has some limitations. The cross-sectional nature of
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different types of addiction are not as rare as they used to be in Saudi Arabia and drug use is a crime punishable by death,[46] it is possible that drug abuse may have been under-reported in this study. Similarly, alcohol consumption may have been under-reported since its production, importation, and consumption are completely banned by the Saudi government.[47]

Taken together, our findings demonstrate that several factors are associated with DV, but financial dependence significantly increases the risk of abuse when all factors are considered. The multi-faceted nature of the factors associated with DV against women in this study highlights the need to design effective DV prevention programs. This may involve educating the population on changing gender norms and addressing issues of abuse through developing social service programs.

Contributorship Statement: This study was done by a single author

Data Sharing Statement: There is no additional data that was not included in this manuscript.

Competing interests: None

For peer review only

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Factors Associated With Domestic Violence: A Cross-sectional Survey Among Women in Jeddah

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Word count: 2025

Abstract

Objective: This study aims to identify the factors associated with domestic violence (DV) among women in Jeddah.

Design: Cross-sectional survey.

Setting: Outpatient departments of three tertiary hospitals in Jeddah.

Participants: Convenience sample of women at the outpatient and inpatient clinics, aged 15-70 years.

Interventions: Between December 15, 2011 and May 30, 2012, a psychologist and a professional health assistant explained the purpose of the research to participants, who were then asked to fill a 50-item questionnaire. The questionnaire was created based on questions from three questionnaires: the NorVold Domestic Abuse Questionnaire, the Pregnancy Risk Assessment Monitoring System, and the Kansas Marital Satisfaction Scale. The questionnaire was used to assess the association between DV and family status, male partner attitudes, age, educational attainment, employment, financial, and socio-economic status.

Results: A total of 2301 women participated in the survey (81% response rate). The mean \pm SD age of the participants was 34.4 ± 10.9 years. The lifetime prevalence of DV was 34.0%. Abused women had more children than non-abused women ($P=.001$), and their spouses were significantly older than those of non-abused women ($p < .0001$). Financially-dependent women and those with a high educational status were significantly more likely to report abuse ($p= .003$ and $p<.001$, respectively). Abused

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women were also likely to report that their spouse was a smoker ($P<.0001$) and had completed at least primary or secondary education ($p<.0001$). A significantly lower proportion of abused women reported that their male partners were alcohol users ($p=0.001$). The results of logistic regression showed that women who were financially-dependent had about 1.5-fold odds of being physically abused by a spouse.

Conclusions: Many factors are associated with DV against women, hence highlighting the need to design effective DV prevention programs.

Article Summary

Article focus:

- The aim of this study was to identify the factors associated with domestic violence (DV) among women.

Key messages:

- Domestic violence is an important health problem in Jeddah.
- Identifying the factors associated with domestic violence is an important step toward designing effective domestic violence prevention programs.

Strengths and limitations of this study:

- The cross-sectional nature of our study prohibits conclusions about causality, predictive ability, and labeling variables as risk factors.
- Only women were surveyed, and the data relied solely on the reports of the participants.
- We recruited a convenience sample of women owing to the difficulties in approaching leaders of women's gathering groups, who were hesitant to give their approval because of the relatively sensitive nature of our theme.
- We did not report factors such as the gender, race and ethnicity of the psychologist and health assistant who were present during data collection. These

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factors would have been important to consider when estimating the reliability and validity of our questionnaire.

- Some women did not respond to certain questions for fear of disclosing too much personal information.
- The potential impact on the self-report of women who needed assistance in completing their questionnaires should also be taken into consideration, as sensitive information was obtained.

INTRODUCTION

Domestic violence (DV) is a common problem that affects men and women worldwide. It was a formerly neglected public health problem, which has gained more visibility over the past few decades. Since its recognition as a serious human rights abuse and important public health problem at key international conferences during the 1990s, including the Fourth World Conference on Women,[1] researchers have shown the increasing prevalence of violence perpetrated on women by their male partners. It was estimated that between 10% and 52% of women from 35 countries worldwide reported they had been physically abused by an intimate partner at some point in their lives, and approximately 10-30% reported they had experienced sexual violence by an intimate male partner.[2, 3]

In the Middle East, there is a paucity of studies on DV although there is a growing body of evidence highlighting the magnitude of this problem among women in developing countries.[4] Findings from previous studies conducted in Egypt, Israel, Palestine, and Tunisia indicate that at least one out of three women was a victim of DV.[4, 5] According to results from two demographic health surveys conducted ten years apart (in 1995 and 2005) in Egypt, beating by an intimate partner was highly prevalent despite increasing levels of education and was not limited to selected risk groups.[6]

Until quite recently, DV was a hidden problem in Saudi Arabia. Only few studies have reported the prevalence of DV among women in three different regions of Saudi Arabia, with prevalence rates ranging from 39.3% to as high as 57.7%.[7, 8] This high prevalence is compounded by cultural norms, which prevent women from reporting

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cases of abuse for fear of social stigma. In their study, Tashkandi et al [7] found that 25.7% of ever-married women attending primary health centers in Medina reported physical abuse; emotional abuse without physical violence was reported in 32.8% of the cases. Of those physically abused, 36.7% and 63.3% suffered minor and severe incidents, respectively. Affif et al,[8] in a community based-study conducted in Al-Ahsa oasis in the Eastern Province of Saudi Arabia, found that 29.1% of the women reported mental abuse, while 22.8% and 11.8% reported physical and sexual abuse, respectively. However, none of these studies identified the factors associated with DV, which is an important step toward designing effective DV prevention programs. This study was designed to identify the factors, such as the woman's educational status,[9, 10] occupation,[9, 11] age,[10, 12, 13] socioeconomic status,[9, 14] alcohol consumption, [10-14] and number of children [11, 15], which have been reported to be significantly associated with spousal abuse.

METHODS

Participants

A cross-sectional survey was performed between December 15, 2011 to March 30, 2012 at three tertiary hospitals in Jeddah, namely King Abdulaziz University Hospital, King Abdulaziz Oncology Medical Center, and King Fahd General Hospital. King Abdulaziz University Hospital was the first university hospital, created in 1956. King Abdulaziz Oncology Medical Center is the largest hospital of the Ministry of Health, and King Fahd General Hospital is the largest government hospital that renders medical services in most major specialties and subspecialties.

The target population consisted of a convenience sample of ever-married women (patients, caregivers, and visitors), aged 15-70 years. Marriages among young women younger than 20 years is uncommon in Saudi Arabia [16], and abuse among women aged above 50 years has not been explored in previous studies conducted in the Kingdom [7, 8]. We excluded all single women and those aged <15 or > 70 years. All participants gave their consent to participate after the nature of the study had been fully explained. Approval to conduct the study was obtained from the Biomedical Ethics Research Committee of King Abdulaziz University.

We included 2301 women from the outpatient and inpatient departments of the above-mentioned hospitals. Of these, 2072 respondents completed the questionnaire, representing an overall response rate of 90.0%. Non-responders, including women who provided partial or incomplete information, comprised 10.0% of the sample population (n

= 229). A follow-up study of non-responders was not performed, as the survey was conducted in a public place.

The purpose of the research was explained by a psychologist and a professional health assistant to all the participants, who were then asked to fill a 50-item questionnaire that comprised questions to identify ever exposure to DV. Special assistance was provided to the illiterate and in cases where further explanation was necessary. The women were requested to fill the questionnaire in a private room that was reserved for this purpose. Participants were guaranteed confidentiality of their responses; they were assured that there would be no specific reference to individuals, but the findings and conclusions will be stated in general terms.

Instrument

We used a questionnaire that was created based on questions from three questionnaires, namely the NorVold Domestic Abuse Questionnaire, the Pregnancy Risk Assessment Monitoring System (PRAMS), and the Kansas Marital Satisfaction Scale.[17-19]

Items Assessed

The questionnaire comprised six sections: (1) the personal data of the couple, including their educational attainment, employment status, and their annual household incomes; (2) items that covered physical, psychological and sexual abuse; (3) help-seeking options of abused women; (4) the damaging effect of violence on the victims; (5) items to score the level of happiness, extracted from the Kansas Marital Satisfaction

Scale;^[18] and (6) items to evaluate the effect of violence on pregnancy and its outcome, extracted from the PRAMS.^[18] The questionnaire was translated into Arabic, and it was revised by experts for accuracy, clarity, and understanding.

In order to describe the mode of living of the participants, we took into consideration the kind of house they rented or owned. Participants were categorized into four groups: (1) lived in rented apartments, (2) lived in self-owned apartments, (3) lived in rented villas, and (4) lived in self-owned villas. The monthly income of the husband was classified into low (1000-3000 SAR per month), middle (>3000-5000 SAR per month), and high (> 5000 SAR per month).

Physical violence was defined as having ever been pushed, beaten, slapped, kicked, hit with a fist or object, pulled by the hair, dragged, burned, or threatened or attacked with a knife or gun by a spouse or family member. Psychological abuse was defined as having ever been threatened by a spouse or family member, prevented from visiting or calling family members and friends, or insulted. Sexual violence was defined as having ever been forced by a spouse or family member to have unwanted intercourse.

We classified marital satisfaction into extremely dissatisfied, very dissatisfied, somewhat dissatisfied, mixed feelings, somewhat satisfied, very satisfied, and extremely satisfied.

Statistical analysis

Data analysis was performed using the Statistical Package for the Social Sciences (SPSS Inc., Chicago, IL, USA), version 18. We used the independent t-test for equal variance and Welch's t-test for unequal variance. Chi square test was used to determine the association between variables. A logistic regression model was used to predict the

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odds of being abused. $P < .05$ was considered statistically significant (95% confidence interval).

Cronbach's alpha was used to test the internal consistency of items that attempted to assess marital satisfaction. If Cronbach's alpha was $> .70$, then the ratio scale was considered reliable.

RESULTS

A total of 2301 women participated in the survey, representing a response rate of 81%. Saudi women comprised 58.3% of the sample ($n=1342$), while expatriate women made up 41.7% of the population ($n=959$). The mean \pm SD age of the women was 34.4 ± 10.9 years. Married women constituted 65.9% of the study population ($n=1516$); 607 women (26.4%) were divorced, 58 (2.5%) were widowed, 36 (1.6%) were single; 84 women (3.8%) did not disclose their marital status.

The lifetime prevalence of DV in our cohort was 34.0%: emotional abuse, 29.0%; physical abuse, 11.6%; and sexual abuse, 4.8%. Based on marital status, 67.3% of the women who reported abuse were married ($n=509$); 28.4% of abused women were divorced, 2.9% were widows ($n=22$), while 1.3% were separated ($n=10$).

Further analysis showed that illiterate women and those who had completed primary education were significantly more likely to report abuse ($p < .0001$; Table 1). Women who were financially dependent on their spouses were also significantly more likely to report

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3 abuse ($p = .003$). Spousal abuse was more frequent in the group of women aged > 50
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6 years, but this difference did not reach statistical significance.
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Table 1. Characteristics of the Abused and Non-abused Women^a

	Non-abused	Abused	Total ^b	P-value
Number of children	3.67 ± 2.38	4.06 ± 2.59	-	.001
Clomiphene-treated cycles (n)	2.63 ± 4.31	2.51 ± 3.81	-	.768
Number of children in the women's families	7.10 ± 3.57	7.33 ± 3.53	-	.145
Age (years)^c				
< 20	44 (65.7)	23 (34.3)	67 (100.0)	.829
21-30	556 (67.5)	268 (32.5)	824 (100.0)	
31-40	553 (65.6)	290 (34.4)	843 (100.0)	
41-50	320 (64.4)	175 (35.6)	495 (100.0)	
> 50	25 (62.5)	15 (37.5)	40 (100.0)	
Total	1498 (66.0)	771 (34.0)	2269 (100.0)	
Mode of Living				
Rented apartment	754 (64.3)	418 (35.7)	1172 (100.0)	.196
Owned apartment	545 (66.9)	270 (33.1)	815 (100.0)	
Rented Villa	61 (68.5)	28 (31.5)	89 (100.0)	
Owned Villa	112 (72.3)	43 (27.7)	155 (100.0)	

Total	1472 (66.0)	759 (34.0)	2231 (100.0)	
Educational Attainment				
Illiterate	118 (62.4)	71 (37.6)	189 (100.0)	
Primary	179 (58.9)	125 (41.1)	304 (100.0)	<.0001
Secondary	493 (65.0)	266 (35.0)	759 (100.0)	
College	629 (71.3)	253 (28.7)	882 (100.0)	
Total	1419 (66.5)	715 (33.5)	2134 (100.0)	
Employment Status				
Unemployed	1072 (65.2)	571 (34.8)	1643 (100.0)	.331
Employed	344 (67.6)	165 (32.4)	509 (100.0)	
Total	1416 (65.8)	736 (34.2)	2152 (100.0)	
Financially Dependent				
Yes	1129 (67.6)	542 (32.4)	1671 (100.0)	.003
No	329 (60.7)	213 (39.3)	542 (100.0)	
Total	1458 (65.9)	755 (34.1)	2213 (100.0)	

^aData are presented as frequency (percent) unless otherwise specified.

^bThe total corresponds to the number of participants who responded to the questions in the individual sections.

^cWomen aged 15-70 years were included.

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The spouses of women who reported DV were significantly older than those of non-abused women ($p < .0001$; Table 2). Participants who reported DV were likely to report that their spouses had completed at least primary or secondary education ($p < .0001$). They were more likely to also report that their male partner was a smoker ($P < .0001$). Conversely, a significantly lower proportion of abused women reported their male partners were alcohol users ($p = 0.001$).

Table 2. Characteristics of the Spouses of Abused and Non-abused Women^a

Characteristic	Non-abused	Abused	Total ^b	P-value
Husband's Age (mean ± SD in years)	41.2 ± 11.9	43.2 ± 12.3	-	<.0001
Husband's Educational Attainment				
Illiterate	87 (53.0)	77 (47.0)	164 (100.0)	<.0001
Primary	339 (60.9)	218 (39.1)	557 (100.0)	
Secondary	449 (67.4)	217 (32.6)	666 (100.0)	
College	463 (71.0)	189 (29.0)	652 (100.0)	
Masters	31 (62.0)	19 (38.0)	50 (100.0)	
Total	1369 (65.5)	720 (34.5)	2089 (100.0)	
Husband's Average Income (in Saudi Arabian Riyals)				
1000-3000	644 (66.6)	322 (33.4)	966 (100.0)	.219
>3000-5000	317 (68.2)	148 (31.8)	465 (100.0)	
>5000-10000	254 (63.7)	135 (36.3)	399 (100.0)	
>10000	176 (73.3)	64 (26.7)	240 (100.0)	
Total	1401 (67.7)	669 (32.3)	2070 (100.0)	
Smoker				
Yes	419 (58.3)	300 (41.7)	719 (100.0)	<.0001
No	215 (72.4)	82 (27.6)	297 (100.0)	
Total	634 (62.4)	382 (37.6)	1016 (100.0)	
Consumes alcohol				
Yes	23 (47.9)	25 (52.1)	48 (100.0)	.001

No	104 (74.3)	36 (25.7)	140 (100.0)	
Total	127 (67.6)	61 (32.4)	188 (100.0)	
Drug user				
Yes	14 (70.0)	6 (30.0)	20 (100.0)	
No	505 (68.5)	232 (31.5)	737 (100.0)	.888
Total	519 (68.5)	238 (31.4)	757 (100.0)	

^aData are presented as frequency (percent) unless otherwise specified.

^bThe total corresponds to the number of participants who responded to the questions in the individual sections.

The results of logistic regression showed that women who were financially-dependent had about 1.5-fold odds of being physically abused by a spouse. Women whose spouses had completed at least primary education had twice the odds of being abused; the odds were also higher in women who had completed primary education. However, these results did not reach statistical significance.

Table 3. Binary logistic regression analysis of factors associated with domestic violence

Variables	Odds ratio	P-value
Number of children	1.019	.547
Husband's age	.999	.882
Number of abortions	1.055	.270
Woman's educational Attainment		.244
Illiterate	1.172	.575
Primary education	1.487	.084
Secondary education	1.327	.095
Financially dependent on husband	1.572	.001
Husband's educational attainment		.034
Primary education	2.102	.146
Secondary education	1.060	.900
College graduate	1.136	.781
Master's	.825	.674

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Abused women were significantly more likely to report body self-hatred, food addiction, and hopelessness (Table 4). On the contrary, gastro-intestinal disorders and loss of trust in others were significantly more frequently reported in the non-abused group. Gynecological disorders, including abortions, metrorrhagia, and menorrhagia were significantly more reported in the abused group (Table 4). Victims of DV were also more likely to report having less weight gain during pregnancy and babies with lower birth weights, but these results did not reach statistical significance.

Table 4. Common mental, medical, and gynecological and obstetrical problems reported by the respondents^a

	Non-Abused	Abused	P-value
Weight gain in pregnancy (kg)	13.85 ± 14.96	13.56 ± 14.86	.696
Babies' average birth weight (kg)	3.02 ± 1.52	2.99 ± 1.61	.689
Number of abortions	1.02 ± 1.24	1.25 ± 1.68	.006
Metrorrhagia	370 (57.2)	277 (42.8)	< .0001
Menorrhagia	244 (54.8)	201 (45.2)	< .0001
Loss of trust in others			
Yes	290 (56.1)	227 (43.9)	< .0001
No	1144 (69.6)	500 (30.4)	
Body self-hatred			
Yes	80 (49.4)	82 (50.6)	< .0001
No	1349 (67.7)	644 (32.3)	
Food addiction			
Yes	102 (46.2)	119 (53.8)	< .0001
No	1330 (68.7)	607 (31.3)	

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Irritable colon or gastric ulcer			
Yes	219 (51.2)	209 (48.8)	< .0001
No	1202 (59.3)	517 (40.7)	
Self-perception as hopeless a person			
Yes	69 (41.2)	96 (58.8)	< .0001
No	1355 (68.2)	632 (31.8)	

^aData are presented as frequency (percent) unless otherwise specified.

Although a large proportion of women reported being satisfied to extremely satisfied in their marriages, abused women were significantly more likely to report being unsatisfied or extremely unsatisfied in their marriages (Cronbach's Alpha = .931; Table 5).

Table 5. Marital satisfaction scale demonstrating the women's level of satisfaction in their marriages^a

	Physically abused ^b		Sexually abused ^b		Emotionally abused ^b		Ever abused ^b	
	No	Yes	No	Yes	No	Yes	No	Yes
Extremely dissatisfied								
	24 (1.3)	19 (7.1)	34 (1.6)	9 (8.2)	17 (1.1)	26 (3.9)	16 (1.1)	27 (3.7)
Very dissatisfied								
	25 (1.3)	14 (5.2)	32 (1.6)	7 (6.4)	15 (1.0)	24 (3.6)	15 (1.0)	24 (3.3)
Somewhat dissatisfied								
	29 (1.5)	22 (8.2)	40 (1.9)	11(10.0)	14 (0.9)	37 (5.5)	11 (0.8)	40 (5.4)
Mixed								
	236 (12.4)	76 (28.3)	279 (13.5)	33 (30.0)	180 (12)	132 (19.6)	170 (11.8)	142 (19.3)
Somewhat satisfied								
	627 (33.0)	68 (25.3)	676 (32.8)	19 (17.3)	456 (30.5)	239 (35.5)	436 (30.3)	259 (35.3)
Very satisfied								
	655 (34.4)	45 (16.7)	681 (33.0)	19 (17.3)	557 (37.2)	143 (21.2)	537 (37.4)	163 (22.2)
Extremely satisfied								
	306 (16.1)	25 (9.3)	319 (15.5)	12 (10.9)	258 (17.2)	73 (10.8)	252 (17.5)	79 (10.8)
Total	1902 (82.7)	269 (11.7)	2061 (89.6)	110 (4.8)	1497 (65.1)	674 (29.3)	1437 (62.5)	734 (31.9)

^aData are presented as frequency (percent).

^bP-value ≤ 0.0001.

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A small proportion of abused women sought help from their families (n=72, 3.1%) or their husbands' families (n=73, 3.2%). Only 56 women (2.4%) planned to see a psychiatrist, while 24 (1.0%) planned to contact social services.

DISCUSSION

This is the first study to explore the factors associated with DV in a large cohort of women in Jeddah, Saudi Arabia. The characteristics analyzed were sociodemographic (age, marital status, educational attainment, employment status, economic autonomy) and behavioral (spousal alcohol, cigarette, and drug use). Although expatriate women comprised nearly half of the sample, all the women were subject to the same threat, as there are limited consequences for perpetrators of DV in a society that is primarily ultraconservative. This allowed us to combine native Saudi and expatriate women.

Our analysis supports the view that women who are unemployed or financially dependent on their spouses may be more likely to experience DV. In particular, financial dependence was associated with approximately 1.5-fold odds of spousal abuse, after controlling other factors, such as age, educational attainment, and the number of children. While economic factors are usually implicated in DV,[20, 21] some authors reported that employment status and relative earnings were not predictive of DV.[22] According to one report, the ability of a woman to leave her abusive male partner was also dependent on her economic autonomy.[20] In societies where a woman can live on her own, a woman may be more inclined to stay with an abusive partner when she does not have the means to afford housing. However, this may not apply to the Saudi society

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3 where a woman cannot live on her own and is obliged to live with her relatives if she is
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5 single or divorced or with her husband if she is married.
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9 Women of lower educational status were significantly more likely to report abuse, which
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11 is in line with those of other authors [10] who reported DV to be more common among
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13 women with a lower level of education. In their report, the authors found that women
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15 with secondary or higher levels of education were significantly less likely to experience
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17 violence than women with less than five years of education. In another report, the
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19 authors found that a reduction in DV risk was associated with secondary education for
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21 both the woman and her partner, there was less consistent evidence of a protective
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23 effect of primary education.[21]
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29 Women who reported DV were likely to report that their spouses had completed at least
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31 primary or secondary education ($p<.0001$); however, we did not find a significant
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33 association between spousal income and DV. Previous analyses of community samples
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35 have shown that that low-socio economic status,[23-25] and low educational status
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37 were significant predictors of DV.[4, 23, 25, 26] In addition, other studies have found
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39 that indicators of household economic prosperity and education of the male partner
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41 were inversely associated with the risk of DV.[27, 28]
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46 Findings from a community and clinical study indicated that among the demographic
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48 factors that were determinants of DV, the more children a woman had, the less likely
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50 was she to be beaten by her partner.[27, 29] On the contrary, our analyses showed that
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52 abused women were more likely to have more children than their non-abused peers.
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Contrary to Caetano et al's [30] report that partner violence is less likely as men age, we found that the spouses of abused women were significantly older than those of non-abused women. However, it is uncertain whether our finding is affected by the age difference between partners, which could set up an unequal balance of power. Findings from another study indicated that having a partner of the same age or younger was a risk factor for intimate partner violence (after controlling for factors, such as acceptance of violence, younger age, and age difference between partners).[31]

In our study, women who reported abuse were likely to report that their male partner was a smoker ($P<.0001$); a significantly lower proportion of abused women reported their male partners were alcohol users ($p=.001$). Findings suggest a link between cigarette smoking and alcohol use in perpetrators of DV. In one study, the authors found that daily smokers had significantly more days of alcohol use prior to starting substance abuse treatment compared to non-daily smoking alcohol dependent offenders of IPV.[31] Other authors reported that DV was associated with higher rates of drunkenness.[3, 33] A similar association was reported between drug abuse and DV.[34]

Several studies have reported a range of mental and physical health disorders in women victims of DV.[35-38] While other authors [37] have cited physical disabilities suicidal thoughts and suicidal attempts to be common among victims of DV, others have reported cases of abruptio placenta, preterm labor, and kidney infections in women who were physically abused.[35] In our study, abused women were more likely to report body self-hatred, food addiction, hopelessness, and gynecological disorders such as metrorrhagia and menorrhagia. Although there is no clear explanation to our findings,

we believe that emotional abuse, which was the common form of abuse in our sample, might have led to negative health perceptions.[39]

Our findings demonstrated that abused women were more likely to report dissatisfaction in their marriages. In addition, less than 5% sought help or planned to seek assistance from social services probably because they are poorly developed in Saudi Arabia.[39, 40] It is plausible that women justified violence,[42-44] which made it difficult for them to leave their spouses or report DV. In addition, religious justification from the Qu'ran is usually cited for wife abuse in Muslim communities;[40, 45] however, this view was not explored, as it was not the focus of our study.

This study is the first to assess risk factors associated with DV among women in a Saudi society. However, our study has some limitations. The cross-sectional nature of our study prohibits conclusions about causality, predictive ability, and labeling variables as risk factors. Only women were surveyed, and the data relied solely on the reports of the participants. Moreover, we recruited a convenience sample of women owing to the difficulties in approaching leaders of women's gathering groups, who were hesitant to give their approval because of the relatively sensitive nature of our theme. The potential impact on the self-report of women who needed assistance in completing their questionnaires should also be taken into consideration, as sensitive information was obtained. We did not also report factors such as the gender, race and ethnicity of the psychologist and health assistant who were present during data collection. These factors would have been important to consider when estimating the reliability and validity of our questionnaire. A further limitation is that some women did not respond to certain questions for fear of disclosing too much personal information. Given that

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different types of addiction are not as rare as they used to be in Saudi Arabia and drug use is a crime punishable by death,[46] it is possible that drug abuse may have been under-reported in this study. Similarly, alcohol consumption may have been under-reported since its production, importation, and consumption are completely banned by the Saudi government.[47]

Taken together, our findings demonstrate that several factors are associated with DV, but financial dependence significantly increases the risk of abuse when all factors are considered. The multi-faceted nature of the factors associated with DV against women in this study highlights the need to design effective DV prevention programs. This may involve educating the population on changing gender norms and addressing issues of abuse through developing social service programs.

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STROBE Statement—checklist of items that should be included in reports of observational studies

	Item No	Recommendation
Title and abstract	1	(a) Indicate the study's design with a commonly used term in the title or the abstract (b) Provide in the abstract an informative and balanced summary of what was done and what was found
Introduction		
Background/rationale	2	Explain the scientific background and rationale for the investigation being reported
Objectives	3	State specific objectives, including any prespecified hypotheses
Methods		
Study design	4	Present key elements of study design early in the paper
Setting	5	Describe the setting, locations, and relevant dates, including periods of recruitment, exposure, follow-up, and data collection
Participants	6	(a) <i>Cohort study</i> —Give the eligibility criteria, and the sources and methods of selection of participants. Describe methods of follow-up <i>Case-control study</i> —Give the eligibility criteria, and the sources and methods of case ascertainment and control selection. Give the rationale for the choice of cases and controls <i>Cross-sectional study</i> —Give the eligibility criteria, and the sources and methods of selection of participants (b) <i>Cohort study</i> —For matched studies, give matching criteria and number of exposed and unexposed <i>Case-control study</i> —For matched studies, give matching criteria and the number of controls per case
Variables	7	Clearly define all outcomes, exposures, predictors, potential confounders, and effect modifiers. Give diagnostic criteria, if applicable
Data sources/ measurement	8*	For each variable of interest, give sources of data and details of methods of assessment (measurement). Describe comparability of assessment methods if there is more than one group
Bias	9	Describe any efforts to address potential sources of bias
Study size	10	Explain how the study size was arrived at
Quantitative variables	11	Explain how quantitative variables were handled in the analyses. If applicable, describe which groupings were chosen and why
Statistical methods	12	(a) Describe all statistical methods, including those used to control for confounding (b) Describe any methods used to examine subgroups and interactions (c) Explain how missing data were addressed (d) <i>Cohort study</i> —If applicable, explain how loss to follow-up was addressed <i>Case-control study</i> —If applicable, explain how matching of cases and controls was addressed <i>Cross-sectional study</i> —If applicable, describe analytical methods taking account of sampling strategy (e) Describe any sensitivity analyses

Continued on next page

Results

Participants	13*	(a) Report numbers of individuals at each stage of study—eg numbers potentially eligible, examined for eligibility, confirmed eligible, included in the study, completing follow-up, and analysed (b) Give reasons for non-participation at each stage (c) Consider use of a flow diagram
Descriptive data	14*	(a) Give characteristics of study participants (eg demographic, clinical, social) and information on exposures and potential confounders (b) Indicate number of participants with missing data for each variable of interest (c) Cohort study—Summarise follow-up time (eg, average and total amount)
Outcome data	15*	Cohort study—Report numbers of outcome events or summary measures over time Case-control study—Report numbers in each exposure category, or summary measures of exposure Cross-sectional study—Report numbers of outcome events or summary measures
Main results	16	(a) Give unadjusted estimates and, if applicable, confounder-adjusted estimates and their precision (eg, 95% confidence interval). Make clear which confounders were adjusted for and why they were included (b) Report category boundaries when continuous variables were categorized (c) If relevant, consider translating estimates of relative risk into absolute risk for a meaningful time period
Other analyses	17	Report other analyses done—eg analyses of subgroups and interactions, and sensitivity analyses

Discussion

Key results	18	Summarise key results with reference to study objectives
Limitations	19	Discuss limitations of the study, taking into account sources of potential bias or imprecision. Discuss both direction and magnitude of any potential bias
Interpretation	20	Give a cautious overall interpretation of results considering objectives, limitations, multiplicity of analyses, results from similar studies, and other relevant evidence
Generalisability	21	Discuss the generalisability (external validity) of the study results

Other information

Funding	22	Give the source of funding and the role of the funders for the present study and, if applicable, for the original study on which the present article is based
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*Give information separately for cases and controls in case-control studies and, if applicable, for exposed and unexposed groups in cohort and cross-sectional studies.

Note: An Explanation and Elaboration article discusses each checklist item and gives methodological background and published examples of transparent reporting. The STROBE checklist is best used in conjunction with this article (freely available on the Web sites of PLoS Medicine at <http://www.plosmedicine.org/>, Annals of Internal Medicine at <http://www.annals.org/>, and Epidemiology at <http://www.epidem.com/>). Information on the STROBE Initiative is available at www.strobe-statement.org.



Factors Associated With Domestic Violence: A Cross-sectional Survey Among Women in Jeddah, Saudi Arabia

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Factors Associated With Domestic Violence: A Cross-sectional Survey Among Women in Jeddah, Saudi Arabia

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Abstract

Objective: This study aims to identify the factors associated with domestic violence (DV) among women in Jeddah.

Design: Cross-sectional survey.

Setting: Outpatient departments of three tertiary hospitals in Jeddah.

Participants: Convenience sample of women at the outpatient and inpatient clinics, aged 15-70 years.

Interventions: Between December 15, 2011 and May 30, 2012, a psychologist and a professional health assistant explained the purpose of the research to participants, who were then asked to fill a 50-item questionnaire. The questionnaire was created based on questions from three questionnaires: the NorVold Domestic Abuse Questionnaire, the Pregnancy Risk Assessment Monitoring System, and the Kansas Marital Satisfaction Scale. The questionnaire was used to assess the association between DV and family status, male partner attitudes, age, educational attainment, employment, financial, and socio-economic status.

Results: A total of 2301 women participated in the survey (81% response rate). The mean \pm SD age of the participants was 34.4 ± 10.9 years. The lifetime prevalence of DV was 34.0%. Abused women had more children than non-abused women ($P=.001$), and their spouses were significantly older than those of non-abused women ($p < .0001$). Financially-dependent women and those with a high educational status were significantly more likely to report abuse ($p= .003$ and $p<.001$, respectively). Abused

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women were also likely to report that their spouse was a smoker ($P<.0001$) and had completed at least primary or secondary education ($p<.0001$). A significantly lower proportion of abused women reported that their male partners were alcohol users ($p=0.001$). The results of logistic regression showed that women who were financially-dependent had about 1.5-fold odds of being physically abused by a spouse.

Conclusions: Many factors are associated with DV against women, hence highlighting the need to design effective DV prevention programs.

Article Summary

Article focus:

- The aim of this study was to identify the factors associated with domestic violence (DV) among women.

Key messages:

- Domestic violence is an important health problem in Jeddah.
- Identifying the factors associated with domestic violence is an important step toward designing effective domestic violence prevention programs.

Strengths and limitations of this study:

- The cross-sectional nature of our study prohibits conclusions about causality, predictive ability, and labeling variables as risk factors.
- Only women were surveyed, and the data relied solely on the reports of the participants.
- We recruited a convenience sample of women owing to the difficulties in approaching leaders of women's gathering groups, who were hesitant to give their approval because of the relatively sensitive nature of our theme.
- We did not report factors such as the gender, race and ethnicity of the psychologist and health assistant who were present during data collection. These

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factors would have been important to consider when estimating the reliability and validity of our questionnaire.

- Some women did not respond to certain questions for fear of disclosing too much personal information.
- The potential impact on the self-report of women who needed assistance in completing their questionnaires should also be taken into consideration, as sensitive information was obtained.

INTRODUCTION

Domestic violence (DV) is a common problem that affects men and women worldwide. It was a formerly neglected public health problem, which has gained more visibility over the past few decades. Since its recognition as a serious human rights abuse and important public health problem at key international conferences during the 1990s, including the Fourth World Conference on Women,[1] researchers have shown the increasing prevalence of violence perpetrated on women by their male partners. It was estimated that between 10% and 52% of women from 35 countries worldwide reported they had been physically abused by an intimate partner at some point in their lives, and approximately 10-30% reported they had experienced sexual violence by an intimate male partner.[2, 3]

In the Middle East, there is a paucity of studies on DV although there is a growing body of evidence highlighting the magnitude of this problem among women in developing countries.[4] Findings from previous studies conducted in Egypt, Israel, Palestine, and Tunisia indicate that at least one out of three women was a victim of DV.[4, 5] According to results from two demographic health surveys conducted ten years apart (in 1995 and 2005) in Egypt, beating by an intimate partner was highly prevalent despite increasing levels of education and was not limited to selected risk groups.[6]

Until quite recently, DV was a hidden problem in Saudi Arabia. Only few studies have reported the prevalence of DV among women in three different regions of Saudi Arabia, with prevalence rates ranging from 39.3% to as high as 57.7%.[7, 8] This high prevalence is compounded by cultural norms, which prevent women from reporting

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cases of abuse for fear of social stigma. In their study, Tashkandi et al [7] found that 25.7% of ever-married women attending primary health centers in Medina reported physical abuse; emotional abuse without physical violence was reported in 32.8% of the cases. Of those physically abused, 36.7% and 63.3% suffered minor and severe incidents, respectively. Affif et al,[8] in a community based-study conducted in Al-Ahsa oasis in the Eastern Province of Saudi Arabia, found that 29.1% of the women reported mental abuse, while 22.8% and 11.8% reported physical and sexual abuse, respectively. However, none of these studies identified the factors associated with DV, which is an important step toward designing effective DV prevention programs. This study was designed to identify the factors, such as the woman's educational status,[9, 10] occupation,[9, 11] age,[10, 12, 13] socioeconomic status,[9, 14] alcohol consumption, [10-14] and number of children [11, 15], which have been reported to be significantly associated with spousal abuse.

METHODS

Participants

A cross-sectional survey was performed between December 15, 2011 to March 30, 2012 at three tertiary hospitals in Jeddah, namely King Abdulaziz University Hospital, King Abdulaziz Oncology Medical Center, and King Fahd General Hospital. King Abdulaziz University Hospital was the first university hospital, created in 1956. King Abdulaziz Oncology Medical Center is the largest hospital of the Ministry of Health, and King Fahd General Hospital is the largest government hospital that renders medical services in most major specialties and subspecialties.

The target population consisted of a convenience sample of ever-married women (patients, caregivers, and visitors), aged 15-70 years. Marriages among young women younger than 20 years is uncommon in Saudi Arabia [16], and abuse among women aged above 50 years has not been explored in previous studies conducted in the Kingdom [7, 8]. We excluded all single women and those aged <15 or > 70 years. All participants gave their consent to participate after the nature of the study had been fully explained. Approval to conduct the study was obtained from the Biomedical Ethics Research Committee of King Abdulaziz University.

We included 2301 women from the outpatient and inpatient departments of the above-mentioned hospitals. Of these, 2072 respondents completed the questionnaire, representing an overall response rate of 90.0%. Non-responders, including women who provided partial or incomplete information, comprised 10.0% of the sample population (n

= 229). A follow-up study of non-responders was not performed, as the survey was conducted in a public place.

The purpose of the research was explained by a psychologist and a professional health assistant to all the participants, who were then asked to fill a 50-item questionnaire that comprised questions to identify ever exposure to DV. Special assistance was provided to the illiterate and in cases where further explanation was necessary. The women were requested to fill the questionnaire in a private room that was reserved for this purpose. Participants were guaranteed confidentiality of their responses; they were assured that there would be no specific reference to individuals, but the findings and conclusions will be stated in general terms.

Instrument

We used a questionnaire that was created based on questions from three questionnaires, namely the NorVold Domestic Abuse Questionnaire, the Pregnancy Risk Assessment Monitoring System (PRAMS), and the Kansas Marital Satisfaction Scale.[17-19]

Items Assessed

The questionnaire comprised six sections: (1) the personal data of the couple, including their educational attainment, employment status, and their annual household incomes; (2) items that covered physical, psychological and sexual abuse; (3) help-seeking options of abused women; (4) the damaging effect of violence on the victims; (5) items to score the level of happiness, extracted from the Kansas Marital Satisfaction

Scale;^[18] and (6) items to evaluate the effect of violence on pregnancy and its outcome, extracted from the PRAMS.^[18] The questionnaire was translated into Arabic, and it was revised by experts for accuracy, clarity, and understanding.

In order to describe the mode of living of the participants, we took into consideration the kind of house they rented or owned. Participants were categorized into four groups: (1) lived in rented apartments, (2) lived in self-owned apartments, (3) lived in rented villas, and (4) lived in self-owned villas. The monthly income of the husband was classified into low (1000-3000 SAR per month), middle (>3000-5000 SAR per month), and high (> 5000 SAR per month).

Physical violence was defined as having ever been pushed, beaten, slapped, kicked, hit with a fist or object, pulled by the hair, dragged, burned, or threatened or attacked with a knife or gun by a spouse or family member. Psychological abuse was defined as having ever been threatened by a spouse or family member, prevented from visiting or calling family members and friends, or insulted. Sexual violence was defined as having ever been forced by a spouse or family member to have unwanted intercourse.

We classified marital satisfaction into extremely dissatisfied, very dissatisfied, somewhat dissatisfied, mixed feelings, somewhat satisfied, very satisfied, and extremely satisfied.

Statistical analysis

Data analysis was performed using the Statistical Package for the Social Sciences (SPSS Inc., Chicago, IL, USA), version 18. We used the independent t-test for equal variance and Welch's t-test for unequal variance. Chi square test was used to determine the association between variables. A logistic regression model was used to predict the

odds of being abused. $P < .05$ was considered statistically significant (95% confidence interval).

Cronbach's alpha was used to test the internal consistency of items that attempted to assess marital satisfaction among women who were physically, sexually or emotionally abused. If Cronbach's alpha was $> .70$, then the ratio scale was considered reliable.

RESULTS

A total of 2301 women participated in the survey, representing a response rate of 81%. Saudi women comprised 58.3% of the sample ($n=1342$), while expatriate women made up 41.7% of the population ($n=959$). Of the expatriate women, 345 (15%) were Yemenis, 126 (5.5%) were Palestinians, 65 (2.8%) were Egyptians, 30 (1.3%) were Somalis, 118 (5.1%) were from African countries, and 275 (11.9%) were from neighboring countries. In total, 1908 women (82.9%) were Arabs. Regarding their religious inclinations, 2235 women (97.1%) were Muslims, while 23 (1.0%) were Christians; 43 women did not specify their religion.

The mean \pm SD age of the women was 34.4 ± 10.9 years. Married women constituted 65.9% of the study population ($n=1516$); 607 women (26.4%) were divorced, 58 (2.5%) were widowed, 36 (1.6%) were single; 84 women (3.8%) did not disclose their marital status.

The lifetime prevalence of DV in our cohort was 34.0%: emotional abuse, 29.0%; physical abuse, 11.6%; and sexual abuse, 4.8%. Based on marital status, 67.3% of the

women who reported abuse were married (n=509); 28.4% of abused women were divorced, 2.9% were widows (n=22), while 1.3% were separated (n=10). By Chi square test, we did not find a significant difference between abused and non-abused women based on their nationality ($p = .0.689$)

In comparing the Saudi versus non-Saudi population, no statistical difference was found in the age distribution between both groups (P Value 0.465). Concerning the marital status, a higher percentage of the non-Saudi group were found to be either separated, divorced or widowed (P value 0.000). The non-Saudi group were also found to have a lower standard of living and lower education (P value 0.000*). This was not reflected on the employment status or the financial dependence on the husband, where no statistical difference was found between Saudis and non-Saudi P value (0.067- 0.708) respectively. In regards to the abuse of women, there was no significant difference between both groups (P value 0.689).

For internal reliability Cronbach's α coefficient was used to evaluate subscales of the domestic violence against women, it showed that Cronbach's alpha equals 0.955, 0.835, and 0.888 for physical, emotional, and sexual violence, respectively with a total score of 0.931.

Further analysis showed that illiterate women and those who had completed primary education were significantly more likely to report abuse ($p < .0001$; Table 1). Women who were financially dependent on their spouses were also significantly more likely to report abuse ($p = .003$). Spousal abuse was more frequent in the group of women aged > 50 years, but this difference did not reach statistical significance.

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Table 1. Characteristics of the Abused and Non-abused Women^a

	Non-abused	Abused	Total ^b	P-value
Number of children	3.67 ± 2.38	4.06 ± 2.59	-	.001
Clomiphene-treated cycles (n)	2.63 ± 4.31	2.51 ± 3.81	-	.768
Number of children in the women's families	7.10 ± 3.57	7.33 ± 3.53	-	.145
Age (years)^c				
< 20	44 (65.7)	23 (34.3)	67 (100.0)	.829
21-30	556 (67.5)	268 (32.5)	824 (100.0)	
31-40	553 (65.6)	290 (34.4)	843 (100.0)	
41-50	320 (64.4)	175 (35.6)	495 (100.0)	
> 50	25 (62.5)	15 (37.5)	40 (100.0)	
Total	1498 (66.0)	771 (34.0)	2269 (100.0)	
Mode of Living				
Rented apartment	754 (64.3)	418 (35.7)	1172 (100.0)	.196
Owned apartment	545 (66.9)	270 (33.1)	815 (100.0)	
Rented Villa	61 (68.5)	28 (31.5)	89 (100.0)	
Owned Villa	112 (72.3)	43 (27.7)	155 (100.0)	

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Total	1472 (66.0)	759 (34.0)	2231 (100.0)	
Educational Attainment				
Illiterate	118 (62.4)	71 (37.6)	189 (100.0)	
Primary	179 (58.9)	125 (41.1)	304 (100.0)	<.0001
Secondary	493 (65.0)	266 (35.0)	759 (100.0)	
College	629 (71.3)	253 (28.7)	882 (100.0)	
Total	1419 (66.5)	715 (33.5)	2134 (100.0)	
Employment Status				
Unemployed	1072 (65.2)	571 (34.8)	1643 (100.0)	.331
Employed	344 (67.6)	165 (32.4)	509 (100.0)	
Total	1416 (65.8)	736 (34.2)	2152 (100.0)	
Financially Dependent				
Yes	1129 (67.6)	542 (32.4)	1671 (100.0)	.003
No	329 (60.7)	213 (39.3)	542 (100.0)	
Total	1458 (65.9)	755 (34.1)	2213 (100.0)	

^aData are presented as frequency (percent) unless otherwise specified.

^bThe total corresponds to the number of participants who responded to the questions in the individual sections.

^cWomen aged 15-70 years were included.

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9 abused women ($p < .0001$; Table 2). Participants who reported DV were likely to report
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11 that their spouses had completed at least primary or secondary education ($p < .0001$).
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13 They were more likely to also report that their male partner was a smoker ($P < .0001$).
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15 Conversely, a significantly lower proportion of abused women reported their male
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17 partners were alcohol users ($p = 0.001$).
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Table 2. Characteristics of the Spouses of Abused and Non-abused Women^a

Characteristic	Non-abused	Abused	Total ^b	P-value
Husband's Age (mean ± SD in years)	41.2 ± 11.9	43.2 ± 12.3	-	<.0001
Husband's Educational Attainment				
Illiterate	87 (53.0)	77 (47.0)	164 (100.0)	<.0001
Primary	339 (60.9)	218 (39.1)	557 (100.0)	
Secondary	449 (67.4)	217 (32.6)	666 (100.0)	
College	463 (71.0)	189 (29.0)	652 (100.0)	
Masters	31 (62.0)	19 (38.0)	50 (100.0)	
Total	1369 (65.5)	720 (34.5)	2089 (100.0)	
Husband's Average Income (in Saudi Arabian Riyals)				
1000-3000	644 (66.6)	322 (33.4)	966 (100.0)	.219
>3000-5000	317 (68.2)	148 (31.8)	465 (100.0)	
>5000-10000	254 (63.7)	135 (36.3)	399 (100.0)	
>10000	176 (73.3)	64 (26.7)	240 (100.0)	
Total	1401 (67.7)	669 (32.3)	2070 (100.0)	
Smoker				
Yes	419 (58.3)	300 (41.7)	719 (100.0)	<.0001
No	215 (72.4)	82 (27.6)	297 (100.0)	
Total	634 (62.4)	382 (37.6)	1016 (100.0)	
Consumes alcohol				
Yes	23 (47.9)	25 (52.1)	48 (100.0)	.001

No	104 (74.3)	36 (25.7)	140 (100.0)	
Total	127 (67.6)	61 (32.4)	188 (100.0)	
Drug user				
Yes	14 (70.0)	6 (30.0)	20 (100.0)	
No	505 (68.5)	232 (31.5)	737 (100.0)	.888
Total	519 (68.5)	238 (31.4)	757 (100.0)	

^aData are presented as frequency (percent) unless otherwise specified.

^bThe total corresponds to the number of participants who responded to the questions in the individual sections.

The results of logistic regression showed that women who were financially-dependent had about 1.5-fold odds of being physically abused by a spouse. Women whose spouses had completed at least primary education had twice the odds of being abused; the odds were also higher in women who had completed primary education. However, these results did not reach statistical significance.

Table 3. Binary logistic regression analysis of factors associated with domestic violence

Variables	Odds ratio	P-value
Number of children	1.019	.547
Husband's age	.999	.882
Number of abortions	1.055	.270
Woman's educational Attainment		.244
Illiterate	1.172	.575
Primary education	1.487	.084
Secondary education	1.327	.095
Financially dependent on husband	1.572	.001
Husband's educational attainment		.034
Primary education	2.102	.146
Secondary education	1.060	.900
College graduate	1.136	.781
Master's	.825	.674

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3 Abused women were significantly more likely to report body self-hatred, food addiction,
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5 and hopelessness (Table 3). On the contrary, gastro-intestinal disorders and loss of
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7 trust in others were significantly more frequently reported in the non-abused group.
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11 Gynecological disorders, including abortions, metrorrhagia, and menorrhagia were
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13 significantly more reported in the abused group (Table 4). Victims of DV were also more
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15 likely to report having less weight gain during pregnancy and babies with lower birth
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17 weights, but these results did not reach statistical significance.
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Table 4. Common mental, medical, and gynecological and obstetrical problems reported by the respondents^a

	Non-Abused	Abused	P-value
Weight gain in pregnancy (kg)	13.85 ± 14.96	13.56 ± 14.86	.696
Babies' average birth weight (kg)	3.02 ± 1.52	2.99 ± 1.61	.689
Number of abortions	1.02 ± 1.24	1.25 ± 1.68	.006
Metrorrhagia	370 (57.2)	277 (42.8)	< .0001
Menorrhagia	244 (54.8)	201 (45.2)	< .0001
Loss of trust in others			
Yes	290 (56.1)	227 (43.9)	< .0001
No	1144 (69.6)	500 (30.4)	
Body self-hatred			
Yes	80 (49.4)	82 (50.6)	< .0001
No	1349 (67.7)	644 (32.3)	
Food addiction			
Yes	102 (46.2)	119 (53.8)	< .0001
No	1330 (68.7)	607 (31.3)	

Irritable colon or gastric ulcer			
Yes	219 (51.2)	209 (48.8)	< .0001
No	1202 (59.3)	517 (40.7)	
Self-perception as hopeless a person			
Yes	69 (41.2)	96 (58.8)	< .0001
No	1355 (68.2)	632 (31.8)	

^aData are presented as frequency (percent) unless otherwise specified.

Although a large proportion of women reported being satisfied to extremely satisfied in their marriages, abused women were significantly more likely to report being unsatisfied or extremely unsatisfied in their marriages (Table 5).

Table 5. Marital satisfaction scale demonstrating the women’s level of satisfaction in their marriages^a

	Physically abused ^b		Sexually abused ^b		Emotionally abused ^b		Ever abused ^b	
	No	Yes	No	Yes	No	Yes	No	Yes
Extremely dissatisfied								
	24 (1.3)	19 (7.1)	34 (1.6)	9 (8.2)	17 (1.1)	26 (3.9)	16 (1.1)	27 (3.7)
Very dissatisfied								
	25 (1.3)	14 (5.2)	32 (1.6)	7 (6.4)	15 (1.0)	24 (3.6)	15 (1.0)	24 (3.3)
Somewhat dissatisfied								
	29 (1.5)	22 (8.2)	40 (1.9)	11(10.0)	14 (0.9)	37 (5.5)	11 (0.8)	40 (5.4)
Mixed								
	236 (12.4)	76 (28.3)	279 (13.5)	33 (30.0)	180 (12)	132 (19.6)	170 (11.8)	142 (19.3)
Somewhat satisfied								
	627 (33.0)	68 (25.3)	676 (32.8)	19 (17.3)	456 (30.5)	239 (35.5)	436 (30.3)	259 (35.3)
Very satisfied								
	655 (34.4)	45 (16.7)	681 (33.0)	19 (17.3)	557 (37.2)	143 (21.2)	537 (37.4)	163 (22.2)
Extremely satisfied								
	306 (16.1)	25 (9.3)	319 (15.5)	12 (10.9)	258 (17.2)	73 (10.8)	252 (17.5)	79 (10.8)
Total	1902 (82.7)	269 (11.7)	2061 (89.6)	110 (4.8)	1497 (65.1)	674 (29.3)	1437 (62.5)	734 (31.9)

^aData are presented as frequency (percent).

^bP-value ≤ 0.0001.

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3 A small proportion of abused women sought help from their families (n=72, 3.1%) or
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5 their husbands' families (n=73, 3.2%). Only 56 women (2.4%) planned to see a
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7 psychiatrist, while 24 (1.0%) planned to contact social services.
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10 11 12 13 14 **DISCUSSION** 15

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18 This is the first study to explore the factors associated with DV in a large cohort of
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20 women in Jeddah, Saudi Arabia. The characteristics analyzed were sociodemographic
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22 (age, marital status, educational attainment, employment status, economic autonomy)
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24 and behavioral (spousal alcohol, cigarette, and drug use). Although expatriate women
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26 comprised nearly half of the sample, all the women were subject to the same threat, as
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28 there are limited consequences for perpetrators of DV in a society that is primarily
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30 ultraconservative. This allowed us to combine native Saudi and expatriate women.
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35 The Cronbach's α coefficients reported in this study showed similar values to that
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37 published in other studies. An article published in Sweden 2013, showed that the
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39 reliability coefficient were 0.79 (psychological scale), 0.80 (physical scale), 0.72 (sexual
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41 scale) and 0.88 (total scale) [20]. These findings were in line with ours. This could be
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43 interpreted as a similarity in internal reliability in spite of differences in both culture and
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45 socioeconomic status between more liberal countries such as Sweden and a
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47 conservative one such as Saudi Arabia.
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52 Our analysis supports the view that women who are unemployed or financially
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54 dependent on their spouses may be more likely to experience DV. In particular, financial
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56 dependence was associated with approximately 1.5-fold odds of spousal abuse, after
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controlling other factors, such as age, educational attainment, and the number of children. While economic factors are usually implicated in DV,[21, 22] some authors reported that employment status and relative earnings were not predictive of DV.[23] According to one report, the ability of a woman to leave her abusive male partner was also dependent on her economic autonomy.[21] In societies where a woman can live on her own, a woman may be more inclined to stay with an abusive partner when she does not have the means to afford housing. However, this may not apply to the Saudi society where a woman cannot live on her own and is obliged to live with her relatives if she is single or divorced or with her husband if she is married.

Women of lower educational status were significantly more likely to report abuse, which is in line with those of other authors [10] who reported DV to be more common among women with a lower level of education. In their report, the authors found that women with secondary or higher levels of education were significantly less likely to experience violence than women with less than five years of education. In another report, the authors found that a reduction in DV risk was associated with secondary education for both the woman and her partner, there was less consistent evidence of a protective effect of primary education.[22]

Women who reported DV were likely to report that their spouses had completed at least primary or secondary education ($p<.0001$); however, we did not find a significant association between spousal income and DV. Previous analyses of community samples have shown that that low-socio economic status,[24-26] and low educational status were significant predictors of DV.[4, 24, 26, 27] In addition, other studies have found

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3 that indicators of household economic prosperity and education of the male partner
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5 were inversely associated with the risk of DV.[28, 29]
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9 Findings from a community and clinical study indicated that among the demographic
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11 factors that were determinants of DV, the more children a woman had, the less likely
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13 was she to be beaten by her partner.[28, 30] On the contrary, our analyses showed that
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15 abused women were more likely to have more children than their non-abused peers.
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19 Contrary to Caetano et al's [31] report that partner violence is less likely as men age, we
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21 found that the spouses of abused women were significantly older than those of non-
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23 abused women. However, it is uncertain whether our finding is affected by the age
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25 difference between partners, which could set up an unequal balance of power. Findings
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27 from another study indicated that having a partner of the same age or younger was a
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29 risk factor for intimate partner violence (after controlling for factors, such as acceptance
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31 of violence, younger age, and age difference between partners).[32]
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37 In our study, women who reported abuse were likely to report that their male partner
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39 was a smoker ($P<.0001$); a significantly lower proportion of abused women reported
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41 their male partners were alcohol users ($p=.001$). Findings suggest a link between
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43 cigarette smoking and alcohol use in perpetrators of DV. In one study, the authors found
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45 that daily smokers had significantly more days of alcohol use prior to starting substance
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47 abuse treatment compared to non-daily smoking alcohol dependent offenders of
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49 IPV.[32] Other authors reported that DV was associated with higher rates of
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51 drunkenness.[33, 34] A similar association was reported between drug abuse and
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53 DV.[35]
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Several studies have reported a range of mental and physical health disorders in women victims of DV.[36-39] While other authors [38] have cited physical disabilities suicidal thoughts and suicidal attempts to be common among victims of DV, others have reported cases of abruptio placenta, preterm labor, and kidney infections in women who were physically abused.[36] In our study, abused women were more likely to report body self-hatred, food addiction, hopelessness, and gynecological disorders such as metrorrhagia and menorrhagia. Although there is no clear explanation to our findings, we believe that emotional abuse, which was the common form of abuse in our sample, might have led to negative health perceptions [40].

Our findings demonstrated that abused women were more likely to report dissatisfaction in their marriages. In addition, less than 5% sought help or planned to seek assistance from social services probably because they are poorly developed in Saudi Arabia [40, 41] It is plausible that women justified violence,[42-45] which made it difficult for them to leave their spouses or report DV. In addition, religious justification from the Qu’ran is usually cited for wife abuse in Muslim communities. [41, 46] however, this view was not explored, as it was not the focus of our study.

This study is the first to assess risk factors associated with DV among women in a Saudi society. However, our study has some limitations. The cross-sectional nature of our study prohibits conclusions about causality, predictive ability, and labeling variables as risk factors. For better assessment of DV, longitudinal cohort studies should be performed to identify past-year exposure to DV at baseline and receipt of DV-relevant preventive services, including counseling for safety and domestic abuse concerns. There is also a need for further research to evaluate intervention in DV cases. Only

women were surveyed, and the data relied solely on the reports of the participants. Moreover, we recruited a convenience sample of women owing to the difficulties in approaching leaders of women's gathering groups, who were hesitant to give their approval because of the relatively sensitive nature of our theme. The potential impact on the self-report of women who needed assistance in completing their questionnaires should also be taken into consideration, as sensitive information was obtained. Hence, it is possible that the prevalence of DV in this study may have been underestimated. We did not also report factors such as the gender, race and ethnicity of the psychologist and health assistant who were present during data collection. These factors would have been important to consider when estimating the reliability and validity of our questionnaire. A further limitation is that some women did not respond to certain questions for fear of disclosing too much personal information. Given that different types of addiction are not as rare as they used to be in Saudi Arabia and drug use is a crime punishable by death.[47] it is possible that drug abuse may have been under-reported in this study. Similarly, alcohol consumption may have been under-reported since its production, importation, and consumption are completely banned by the Saudi government.[48]

Taken together, our findings demonstrate that several factors are associated with DV, but financial dependence significantly increases the risk of abuse when all factors are considered. The multi-faceted nature of the factors associated with DV against women in this study highlights the need to design effective DV prevention programs. This may involve educating the population on changing gender norms and addressing issues of abuse through developing social service programs.

Data sharing: No additional data available.

Competing Interests: None

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**Factors Associated With Domestic Violence: A Cross-sectional Survey Among
Women in Jeddah, Saudi Arabia**

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Abstract

Objective: This study aims to identify the factors associated with domestic violence (DV) among women in Jeddah.

Design: Cross-sectional survey.

Setting: Outpatient departments of three tertiary hospitals in Jeddah.

Participants: Convenience sample of women at the outpatient and inpatient clinics, aged 15-70 years.

Interventions: Between December 15, 2011 and May 30, 2012, a psychologist and a professional health assistant explained the purpose of the research to participants, who were then asked to fill a 50-item questionnaire. The questionnaire was created based on questions from three questionnaires: the NorVold Domestic Abuse Questionnaire, the Pregnancy Risk Assessment Monitoring System, and the Kansas Marital Satisfaction Scale. The questionnaire was used to assess the association between DV and family status, male partner attitudes, age, educational attainment, employment, financial, and socio-economic status.

Results: A total of 2301 women participated in the survey (81% response rate). The mean \pm SD age of the participants was 34.4 ± 10.9 years. The lifetime prevalence of DV was 34.0%. Abused women had more children than non-abused women ($P=.001$), and their spouses were significantly older than those of non-abused women ($p <.0001$). Financially-dependent women and those with a high educational status were significantly more likely to report abuse ($p= .003$ and $p<.001$, respectively). Abused

women were also likely to report that their spouse was a smoker ($P<.0001$) and had completed at least primary or secondary education ($p<.0001$). A significantly lower proportion of abused women reported that their male partners were alcohol users ($p=0.001$). The results of logistic regression showed that women who were financially-dependent had about 1.5-fold odds of being physically abused by a spouse.

Conclusions: Many factors are associated with DV against women, hence highlighting the need to design effective DV prevention programs.

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Article Summary

Article focus:

- The aim of this study was to identify the factors associated with domestic violence (DV) among women.

Key messages:

- Domestic violence is an important health problem in Jeddah.
- Identifying the factors associated with domestic violence is an important step toward designing effective domestic violence prevention programs.

Strengths and limitations of this study:

- The cross-sectional nature of our study prohibits conclusions about causality, predictive ability, and labeling variables as risk factors.
- Only women were surveyed, and the data relied solely on the reports of the participants.
- We recruited a convenience sample of women owing to the difficulties in approaching leaders of women’s gathering groups, who were hesitant to give their approval because of the relatively sensitive nature of our theme.
- We did not report factors such as the gender, race and ethnicity of the psychologist and health assistant who were present during data collection. These

factors would have been important to consider when estimating the reliability and validity of our questionnaire.

- Some women did not respond to certain questions for fear of disclosing too much personal information.
- The potential impact on the self-report of women who needed assistance in completing their questionnaires should also be taken into consideration, as sensitive information was obtained.

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INTRODUCTION

Domestic violence (DV) is a common problem that affects men and women worldwide. It was a formerly neglected public health problem, which has gained more visibility over the past few decades. Since its recognition as a serious human rights abuse and important public health problem at key international conferences during the 1990s, including the Fourth World Conference on Women,[1] researchers have shown the increasing prevalence of violence perpetrated on women by their male partners. It was estimated that between 10% and 52% of women from 35 countries worldwide reported they had been physically abused by an intimate partner at some point in their lives, and approximately 10-30% reported they had experienced sexual violence by an intimate male partner.[2, 3]

In the Middle East, there is a paucity of studies on DV although there is a growing body of evidence highlighting the magnitude of this problem among women in developing countries.[4] Findings from previous studies conducted in Egypt, Israel, Palestine, and Tunisia indicate that at least one out of three women was a victim of DV.[4, 5] According to results from two demographic health surveys conducted ten years apart (in 1995 and 2005) in Egypt, beating by an intimate partner was highly prevalent despite increasing levels of education and was not limited to selected risk groups.[6]

Until quite recently, DV was a hidden problem in Saudi Arabia. Only few studies have reported the prevalence of DV among women in three different regions of Saudi Arabia, with prevalence rates ranging from 39.3% to as high as 57.7%.[7, 8] This high prevalence is compounded by cultural norms, which prevent women from reporting

cases of abuse for fear of social stigma. In their study, Tashkandi et al [7] found that 25.7% of ever-married women attending primary health centers in Medina reported physical abuse; emotional abuse without physical violence was reported in 32.8% of the cases. Of those physically abused, 36.7% and 63.3% suffered minor and severe incidents, respectively. Affif et al,[8] in a community based-study conducted in Al-Ahsa oasis in the Eastern Province of Saudi Arabia, found that 29.1% of the women reported mental abuse, while 22.8% and 11.8% reported physical and sexual abuse, respectively. However, none of these studies identified the factors associated with DV, which is an important step toward designing effective DV prevention programs. This study was designed to identify the factors, such as the woman's educational status,[9, 10] occupation,[9, 11] age,[10, 12, 13] socioeconomic status,[9, 14] alcohol consumption, [10-14] and number of children [11, 15], which have been reported to be significantly associated with spousal abuse.

METHODS

Participants

A cross-sectional survey was performed between December 15, 2011 to March 30, 2012 at three tertiary hospitals in Jeddah, namely King Abdulaziz University Hospital, King Abdulaziz Oncology Medical Center, and King Fahd General Hospital. King Abdulaziz University Hospital was the first university hospital, created in 1956. King Abdulaziz Oncology Medical Center is the largest hospital of the Ministry of Health, and King Fahd General Hospital is the largest government hospital that renders medical services in most major specialties and subspecialties.

The target population consisted of a convenience sample of ever-married women (patients, caregivers, and visitors), aged 15-70 years. Marriages among young women younger than 20 years is uncommon in Saudi Arabia [16], and abuse among women aged above 50 years has not been explored in previous studies conducted in the Kingdom [7, 8]. We excluded all single women and those aged <15 or > 70 years. All participants gave their consent to participate after the nature of the study had been fully explained. Approval to conduct the study was obtained from the Biomedical Ethics Research Committee of King Abdulaziz University.

We included 2301 women from the outpatient and inpatient departments of the above-mentioned hospitals. Of these, 2072 respondents completed the questionnaire, representing an overall response rate of 90.0%. Non-responders, including women who provided partial or incomplete information, comprised 10.0% of the sample population (n

= 229). A follow-up study of non-responders was not performed, as the survey was conducted in a public place.

The purpose of the research was explained by a psychologist and a professional health assistant to all the participants, who were then asked to fill a 50-item questionnaire that comprised questions to identify ever exposure to DV. Special assistance was provided to the illiterate and in cases where further explanation was necessary. The women were requested to fill the questionnaire in a private room that was reserved for this purpose. Participants were guaranteed confidentiality of their responses; they were assured that there would be no specific reference to individuals, but the findings and conclusions will be stated in general terms.

Instrument

We used a questionnaire that was created based on questions from three questionnaires, namely the NorVold Domestic Abuse Questionnaire, the Pregnancy Risk Assessment Monitoring System (PRAMS), and the Kansas Marital Satisfaction Scale.[17-19]

Items Assessed

The questionnaire comprised six sections: (1) the personal data of the couple, including their educational attainment, employment status, and their annual household incomes; (2) items that covered physical, psychological and sexual abuse; (3) help-seeking options of abused women; (4) the damaging effect of violence on the victims; (5) items to score the level of happiness, extracted from the Kansas Marital Satisfaction

Scale;^[18] and (6) items to evaluate the effect of violence on pregnancy and its outcome, extracted from the PRAMS.^[18] The questionnaire was translated into Arabic, and it was revised by experts for accuracy, clarity, and understanding.

In order to describe the mode of living of the participants, we took into consideration the kind of house they rented or owned. Participants were categorized into four groups: (1) lived in rented apartments, (2) lived in self-owned apartments, (3) lived in rented villas, and (4) lived in self-owned villas. The monthly income of the husband was classified into low (1000-3000 SAR per month), middle (>3000-5000 SAR per month), and high (> 5000 SAR per month).

Physical violence was defined as having ever been pushed, beaten, slapped, kicked, hit with a fist or object, pulled by the hair, dragged, burned, or threatened or attacked with a knife or gun by a spouse or family member. Psychological abuse was defined as having ever been threatened by a spouse or family member, prevented from visiting or calling family members and friends, or insulted. Sexual violence was defined as having ever been forced by a spouse or family member to have unwanted intercourse.

We classified marital satisfaction into extremely dissatisfied, very dissatisfied, somewhat dissatisfied, mixed feelings, somewhat satisfied, very satisfied, and extremely satisfied.

Statistical analysis

Data analysis was performed using the Statistical Package for the Social Sciences (SPSS Inc., Chicago, IL, USA), version 18. We used the independent t-test for equal variance and Welch’s t-test for unequal variance. Chi square test was used to determine the association between variables. A logistic regression model was used to predict the

odds of being abused. $P < .05$ was considered statistically significant (95% confidence interval).

Cronbach's alpha was used to test the internal consistency of items that attempted to assess marital satisfaction among women who were physically, sexually or emotionally abused. If Cronbach's alpha was $> .70$, then the ratio scale was considered reliable.

RESULTS

A total of 2301 women participated in the survey, representing a response rate of 81%. Saudi women comprised 58.3% of the sample ($n=1342$), while expatriate women made up 41.7% of the population ($n=959$). Of the expatriate women, 345 (15%) were Yemenis, 126 (5.5%) were Palestinians, 65 (2.8%) were Egyptians, 30 (1.3%) were Somalis, 118 (5.1%) were from African countries, and 275 (11.9%) were from neighboring countries. In total, 1908 women (82.9%) were Arabs. Regarding their religious inclinations, 2235 women (97.1%) were Muslims, while 23 (1.0%) were Christians; 43 women did not specify their religion.

The mean \pm SD age of the women was 34.4 ± 10.9 years. Married women constituted 65.9% of the study population ($n=1516$); 607 women (26.4%) were divorced, 58 (2.5%) were widowed, 36 (1.6%) were single; 84 women (3.8%) did not disclose their marital status.

The lifetime prevalence of DV in our cohort was 34.0%: emotional abuse, 29.0%; physical abuse, 11.6%; and sexual abuse, 4.8%. Based on marital status, 67.3% of the

women who reported abuse were married (n=509); 28.4% of abused women were divorced, 2.9% were widows (n=22), while 1.3% were separated (n=10). By Chi square test, we did not find a significant difference between abused and non-abused women based on their nationality (p =.0.689)

In comparing the Saudi versus non-Saudi population, no statistical difference was found in the age distribution between both groups (P Value 0.465). Concerning the marital status, a higher percentage of the non-Saudi group were found to be either separated, divorced or widowed (P value 0.000). The non-Saudi group were also found to have a lower standard of living and lower education (P value 0.000*). This was not reflected on the employment status or the financial dependence on the husband, where no statistical difference was found between Saudis and non-Saudi P value (0.067- 0.708) respectively. In regards to the abuse of women, there was no significant difference between both groups (P value 0.689).

For internal reliability Cronbach's α coefficient was used to evaluate subscales of the domestic violence against women, it showed that Cronbach's alpha equals 0.955, 0.835, and 0.888 for physical, emotional, and sexual violence, respectively with a total score of 0.931.

Further analysis showed that illiterate women and those who had completed primary education were significantly more likely to report abuse (p<.0001; Table 1). Women who were financially dependent on their spouses were also significantly more likely to report abuse (p = .003). Spousal abuse was more frequent in the group of women aged > 50 years, but this difference did not reach statistical significance.

For peer review only

Table 1. Characteristics of the Abused and Non-abused Women^a

	Non-abused	Abused	Total ^b	P-value
Number of children	3.67 ± 2.38	4.06 ± 2.59	-	.001
Clomiphene-treated cycles (n)	2.63 ± 4.31	2.51 ± 3.81	-	.768
Number of children in the women's families	7.10 ± 3.57	7.33 ± 3.53	-	.145
Age (years)^c				
< 20	44 (65.7)	23 (34.3)	67 (100.0)	.829
21-30	556 (67.5)	268 (32.5)	824 (100.0)	
31-40	553 (65.6)	290 (34.4)	843 (100.0)	
41-50	320 (64.4)	175 (35.6)	495 (100.0)	
> 50	25 (62.5)	15 (37.5)	40 (100.0)	
Total	1498 (66.0)	771 (34.0)	2269 (100.0)	
Mode of Living				
Rented apartment	754 (64.3)	418 (35.7)	1172 (100.0)	.196
Owned apartment	545 (66.9)	270 (33.1)	815 (100.0)	
Rented Villa	61 (68.5)	28 (31.5)	89 (100.0)	
Owned Villa	112 (72.3)	43 (27.7)	155 (100.0)	

Total	1472 (66.0)	759 (34.0)	2231 (100.0)	
Educational Attainment				
Illiterate	118 (62.4)	71 (37.6)	189 (100.0)	
Primary	179 (58.9)	125 (41.1)	304 (100.0)	<.0001
Secondary	493 (65.0)	266 (35.0)	759 (100.0)	
College	629 (71.3)	253 (28.7)	882 (100.0)	
Total	1419 (66.5)	715 (33.5)	2134 (100.0)	
Employment Status				
Unemployed	1072 (65.2)	571 (34.8)	1643 (100.0)	.331
Employed	344 (67.6)	165 (32.4)	509 (100.0)	
Total	1416 (65.8)	736 (34.2)	2152 (100.0)	
Financially Dependent				
Yes	1129 (67.6)	542 (32.4)	1671 (100.0)	.003
No	329 (60.7)	213 (39.3)	542 (100.0)	
Total	1458 (65.9)	755 (34.1)	2213 (100.0)	

^aData are presented as frequency (percent) unless otherwise specified.

^bThe total corresponds to the number of participants who responded to the questions in the individual sections.

^cWomen aged 15-70 years were included.

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The spouses of women who reported DV were significantly older than those of non-abused women ($p < .0001$; Table 2). Participants who reported DV were likely to report that their spouses had completed at least primary or secondary education ($p < .0001$). They were more likely to also report that their male partner was a smoker ($P < .0001$). Conversely, a significantly lower proportion of abused women reported their male partners were alcohol users ($p = 0.001$).

Table 2. Characteristics of the Spouses of Abused and Non-abused Women^a

Characteristic	Non-abused	Abused	Total ^b	P-value
Husband's Age (mean ± SD in years)	41.2 ± 11.9	43.2 ± 12.3	-	<.0001
Husband's Educational Attainment				
Illiterate	87 (53.0)	77 (47.0)	164 (100.0)	<.0001
Primary	339 (60.9)	218 (39.1)	557 (100.0)	
Secondary	449 (67.4)	217 (32.6)	666 (100.0)	
College	463 (71.0)	189 (29.0)	652 (100.0)	
Masters	31 (62.0)	19 (38.0)	50 (100.0)	
Total	1369 (65.5)	720 (34.5)	2089 (100.0)	
Husband's Average Income (in Saudi Arabian Riyals)				
1000-3000	644 (66.6)	322 (33.4)	966 (100.0)	.219
>3000-5000	317 (68.2)	148 (31.8)	465 (100.0)	
>5000-10000	254 (63.7)	135 (36.3)	399 (100.0)	
>10000	176 (73.3)	64 (26.7)	240 (100.0)	
Total	1401 (67.7)	669 (32.3)	2070 (100.0)	
Smoker				
Yes	419 (58.3)	300 (41.7)	719 (100.0)	<.0001
No	215 (72.4)	82 (27.6)	297 (100.0)	
Total	634 (62.4)	382 (37.6)	1016 (100.0)	
Consumes alcohol				
Yes	23 (47.9)	25 (52.1)	48 (100.0)	.001

No	104 (74.3)	36 (25.7)	140 (100.0)	
Total	127 (67.6)	61 (32.4)	188 (100.0)	
Drug user				
Yes	14 (70.0)	6 (30.0)	20 (100.0)	
No	505 (68.5)	232 (31.5)	737 (100.0)	.888
Total	519 (68.5)	238 (31.4)	757 (100.0)	

^aData are presented as frequency (percent) unless otherwise specified.

^bThe total corresponds to the number of participants who responded to the questions in the individual sections.

The results of logistic regression showed that women who were financially-dependent had about 1.5-fold odds of being physically abused by a spouse. Women whose spouses had completed at least primary education had twice the odds of being abused; the odds were also higher in women who had completed primary education. However, these results did not reach statistical significance.

Table 3. Binary logistic regression analysis of factors associated with domestic violence

Variables	Odds ratio	P-value
Number of children	1.019	.547
Husband's age	.999	.882
Number of abortions	1.055	.270
Woman's educational Attainment		.244
Illiterate	1.172	.575
Primary education	1.487	.084
Secondary education	1.327	.095
Financially dependent on husband	1.572	.001
Husband's educational attainment		.034
Primary education	2.102	.146
Secondary education	1.060	.900
College graduate	1.136	.781
Master's	.825	.674

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Abused women were significantly more likely to report body self-hatred, food addiction, and hopelessness (Table 4). On the contrary, gastro-intestinal disorders and loss of trust in others were significantly more frequently reported in the non-abused group.

Gynecological disorders, including abortions, metrorrhagia, and menorrhagia were significantly more reported in the abused group (Table 4). Victims of DV were also more likely to report having less weight gain during pregnancy and babies with lower birth weights, but these results did not reach statistical significance.

Table 4. Common mental, medical, and gynecological and obstetrical problems reported by the respondents^a

	Non-Abused	Abused	P-value
Weight gain in pregnancy (kg)	13.85 ± 14.96	13.56 ± 14.86	.696
Babies' average birth weight (kg)	3.02 ± 1.52	2.99 ± 1.61	.689
Number of abortions	1.02 ± 1.24	1.25 ± 1.68	.006
Metrorrhagia	370 (57.2)	277 (42.8)	< .0001
Menorrhagia	244 (54.8)	201 (45.2)	< .0001
Loss of trust in others			
Yes	290 (56.1)	227 (43.9)	< .0001
No	1144 (69.6)	500 (30.4)	
Body self-hatred			
Yes	80 (49.4)	82 (50.6)	< .0001
No	1349 (67.7)	644 (32.3)	
Food addiction			
Yes	102 (46.2)	119 (53.8)	< .0001
No	1330 (68.7)	607 (31.3)	

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Irritable colon or gastric ulcer			
Yes	219 (51.2)	209 (48.8)	< .0001
No	1202 (59.3)	517 (40.7)	
Self-perception as hopeless a person			
Yes	69 (41.2)	96 (58.8)	< .0001
No	1355 (68.2)	632 (31.8)	

^aData are presented as frequency (percent) unless otherwise specified.

Although a large proportion of women reported being satisfied to extremely satisfied in their marriages, abused women were significantly more likely to report being unsatisfied or extremely unsatisfied in their marriages (Table 5).

Table 5. Marital satisfaction scale demonstrating the women's level of satisfaction in their marriages^a

	Physically abused ^b		Sexually abused ^b		Emotionally abused ^b		Ever abused ^b	
	No	Yes	No	Yes	No	Yes	No	Yes
Extremely dissatisfied								
	24 (1.3)	19 (7.1)	34 (1.6)	9 (8.2)	17 (1.1)	26 (3.9)	16 (1.1)	27 (3.7)
Very dissatisfied								
	25 (1.3)	14 (5.2)	32 (1.6)	7 (6.4)	15 (1.0)	24 (3.6)	15 (1.0)	24 (3.3)
Somewhat dissatisfied								
	29 (1.5)	22 (8.2)	40 (1.9)	11(10.0)	14 (0.9)	37 (5.5)	11 (0.8)	40 (5.4)
Mixed								
	236 (12.4)	76 (28.3)	279 (13.5)	33 (30.0)	180 (12)	132 (19.6)	170 (11.8)	142 (19.3)
Somewhat satisfied								
	627 (33.0)	68 (25.3)	676 (32.8)	19 (17.3)	456 (30.5)	239 (35.5)	436 (30.3)	259 (35.3)
Very satisfied								
	655 (34.4)	45 (16.7)	681 (33.0)	19 (17.3)	557 (37.2)	143 (21.2)	537 (37.4)	163 (22.2)
Extremely satisfied								
	306 (16.1)	25 (9.3)	319 (15.5)	12 (10.9)	258 (17.2)	73 (10.8)	252 (17.5)	79 (10.8)
Total	1902 (82.7)	269 (11.7)	2061 (89.6)	110 (4.8)	1497 (65.1)	674 (29.3)	1437 (62.5)	734 (31.9)

^aData are presented as frequency (percent).

^bP-value ≤ 0.0001.

A small proportion of abused women sought help from their families (n=72, 3.1%) or their husbands' families (n=73, 3.2%). Only 56 women (2.4%) planned to see a psychiatrist, while 24 (1.0%) planned to contact social services.

DISCUSSION

This is the first study to explore the factors associated with DV in a large cohort of women in Jeddah, Saudi Arabia. The characteristics analyzed were sociodemographic (age, marital status, educational attainment, employment status, economic autonomy) and behavioral (spousal alcohol, cigarette, and drug use). Although expatriate women comprised nearly half of the sample, all the women were subject to the same threat, as there are limited consequences for perpetrators of DV in a society that is primarily ultraconservative. This allowed us to combine native Saudi and expatriate women.

The Cronbach's α coefficients reported in this study showed similar values to that published in other studies. An article published in Sweden 2013, showed that the reliability coefficient were 0.79 (psychological scale), 0.80 (physical scale), 0.72 (sexual scale) and 0.88 (total scale) [20]. These findings were in line with ours. This could be interpreted as a similarity in internal reliability in spite of differences in both culture and socioeconomic status between more liberal countries such as Sweden and a conservative one such as Saudi Arabia.

Our analysis supports the view that women who are unemployed or financially dependent on their spouses may be more likely to experience DV. In particular, financial dependence was associated with approximately 1.5-fold odds of spousal abuse, after

controlling other factors, such as age, educational attainment, and the number of children. While economic factors are usually implicated in DV,[21, 22] some authors reported that employment status and relative earnings were not predictive of DV.[23] According to one report, the ability of a woman to leave her abusive male partner was also dependent on her economic autonomy.[21] In societies where a woman can live on her own, a woman may be more inclined to stay with an abusive partner when she does not have the means to afford housing. However, this may not apply to the Saudi society where a woman cannot live on her own and is obliged to live with her relatives if she is single or divorced or with her husband if she is married.

Women of lower educational status were significantly more likely to report abuse, which is in line with those of other authors [10] who reported DV to be more common among women with a lower level of education. In their report, the authors found that women with secondary or higher levels of education were significantly less likely to experience violence than women with less than five years of education. In another report, the authors found that a reduction in DV risk was associated with secondary education for both the woman and her partner, there was less consistent evidence of a protective effect of primary education.[22]

Women who reported DV were likely to report that their spouses had completed at least primary or secondary education ($p<.0001$); however, we did not find a significant association between spousal income and DV. Previous analyses of community samples have shown that that low-socio economic status,[24-26] and low educational status were significant predictors of DV.[4, 24, 26, 27] In addition, other studies have found

that indicators of household economic prosperity and education of the male partner were inversely associated with the risk of DV.[28, 29]

Findings from a community and clinical study indicated that among the demographic factors that were determinants of DV, the more children a woman had, the less likely was she to be beaten by her partner.[28, 30] On the contrary, our analyses showed that abused women were more likely to have more children than their non-abused peers.

Contrary to Caetano et al's [31] report that partner violence is less likely as men age, we found that the spouses of abused women were significantly older than those of non-abused women. However, it is uncertain whether our finding is affected by the age difference between partners, which could set up an unequal balance of power. Findings from another study indicated that having a partner of the same age or younger was a risk factor for intimate partner violence (after controlling for factors, such as acceptance of violence, younger age, and age difference between partners).[32]

In our study, women who reported abuse were likely to report that their male partner was a smoker ($P<.0001$); a significantly lower proportion of abused women reported their male partners were alcohol users ($p=.001$). Findings suggest a link between cigarette smoking and alcohol use in perpetrators of DV. In one study, the authors found that daily smokers had significantly more days of alcohol use prior to starting substance abuse treatment compared to non-daily smoking alcohol dependent offenders of IPV.[32] Other authors reported that DV was associated with higher rates of drunkenness.[33, 34] A similar association was reported between drug abuse and DV.[35]

Several studies have reported a range of mental and physical health disorders in women victims of DV.[36-39] While other authors [38] have cited physical disabilities suicidal thoughts and suicidal attempts to be common among victims of DV, others have reported cases of abruptio placenta, preterm labor, and kidney infections in women who were physically abused.[36] In our study, abused women were more likely to report body self-hatred, food addiction, hopelessness, and gynecological disorders such as metrorrhagia and menorrhagia. Although there is no clear explanation to our findings, we believe that emotional abuse, which was the common form of abuse in our sample, might have led to negative health perceptions [40].

Our findings demonstrated that abused women were more likely to report dissatisfaction in their marriages. In addition, less than 5% sought help or planned to seek assistance from social services probably because they are poorly developed in Saudi Arabia [40, 41] It is plausible that women justified violence,[43-45] which made it difficult for them to leave their spouses or report DV. In addition, religious justification from the Qu'ran is usually cited for wife abuse in Muslim communities. [41, 46] however, this view was not explored, as it was not the focus of our study.

This study is the first to assess risk factors associated with DV among women in a Saudi society. However, our study has some limitations. The cross-sectional nature of our study prohibits conclusions about causality, predictive ability, and labeling variables as risk factors. For better assessment of DV, longitudinal cohort studies should be performed to identify past-year exposure to DV at baseline and receipt of DV-relevant preventive services, including counseling for safety and domestic abuse concerns. There is also a need for further research to evaluate intervention in DV cases. Only

women were surveyed, and the data relied solely on the reports of the participants. Moreover, we recruited a convenience sample of women owing to the difficulties in approaching leaders of women’s gathering groups, who were hesitant to give their approval because of the relatively sensitive nature of our theme. The potential impact on the self-report of women who needed assistance in completing their questionnaires should also be taken into consideration, as sensitive information was obtained. Hence, it is possible that the prevalence of DV in this study may have been underestimated. We did not also report factors such as the gender, race and ethnicity of the psychologist and health assistant who were present during data collection. These factors would have been important to consider when estimating the reliability and validity of our questionnaire. A further limitation is that some women did not respond to certain questions for fear of disclosing too much personal information. Given that different types of addiction are not as rare as they used to be in Saudi Arabia and drug use is a crime punishable by death.[47] it is possible that drug abuse may have been under-reported in this study. Similarly, alcohol consumption may have been under-reported since its production, importation, and consumption are completely banned by the Saudi government.[48]

Taken together, our findings demonstrate that several factors are associated with DV, but financial dependence significantly increases the risk of abuse when all factors are considered. The multi-faceted nature of the factors associated with DV against women in this study highlights the need to design effective DV prevention programs. This may involve educating the population on changing gender norms and addressing issues of abuse through developing social service programs.

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STROBE Statement—checklist of items that should be included in reports of observational studies

	Item No	Recommendation
Title and abstract	1	(a) Indicate the study’s design with a commonly used term in the title or the abstract (b) Provide in the abstract an informative and balanced summary of what was done and what was found
Introduction		
Background/rationale	2	Explain the scientific background and rationale for the investigation being reported
Objectives	3	State specific objectives, including any prespecified hypotheses
Methods		
Study design	4	Present key elements of study design early in the paper
Setting	5	Describe the setting, locations, and relevant dates, including periods of recruitment, exposure, follow-up, and data collection
Participants	6	(a) Cohort study—Give the eligibility criteria, and the sources and methods of selection of participants. Describe methods of follow-up Case-control study—Give the eligibility criteria, and the sources and methods of case ascertainment and control selection. Give the rationale for the choice of cases and controls Cross-sectional study—Give the eligibility criteria, and the sources and methods of selection of participants (b) Cohort study—For matched studies, give matching criteria and number of exposed and unexposed Case-control study—For matched studies, give matching criteria and the number of controls per case
Variables	7	Clearly define all outcomes, exposures, predictors, potential confounders, and effect modifiers. Give diagnostic criteria, if applicable
Data sources/ measurement	8*	For each variable of interest, give sources of data and details of methods of assessment (measurement). Describe comparability of assessment methods if there is more than one group
Bias	9	Describe any efforts to address potential sources of bias
Study size	10	Explain how the study size was arrived at
Quantitative variables	11	Explain how quantitative variables were handled in the analyses. If applicable, describe which groupings were chosen and why
Statistical methods	12	(a) Describe all statistical methods, including those used to control for confounding (b) Describe any methods used to examine subgroups and interactions (c) Explain how missing data were addressed (d) Cohort study—If applicable, explain how loss to follow-up was addressed Case-control study—If applicable, explain how matching of cases and controls was addressed Cross-sectional study—If applicable, describe analytical methods taking account of sampling strategy (e) Describe any sensitivity analyses

Continued on next page

Results

Participants	13*	(a) Report numbers of individuals at each stage of study—eg numbers potentially eligible, examined for eligibility, confirmed eligible, included in the study, completing follow-up, and analysed (b) Give reasons for non-participation at each stage (c) Consider use of a flow diagram
Descriptive data	14*	(a) Give characteristics of study participants (eg demographic, clinical, social) and information on exposures and potential confounders (b) Indicate number of participants with missing data for each variable of interest (c) <i>Cohort study</i> —Summarise follow-up time (eg, average and total amount)
Outcome data	15*	<i>Cohort study</i> —Report numbers of outcome events or summary measures over time <i>Case-control study</i> —Report numbers in each exposure category, or summary measures of exposure <i>Cross-sectional study</i> —Report numbers of outcome events or summary measures
Main results	16	(a) Give unadjusted estimates and, if applicable, confounder-adjusted estimates and their precision (eg, 95% confidence interval). Make clear which confounders were adjusted for and why they were included (b) Report category boundaries when continuous variables were categorized (c) If relevant, consider translating estimates of relative risk into absolute risk for a meaningful time period
Other analyses	17	Report other analyses done—eg analyses of subgroups and interactions, and sensitivity analyses

Discussion

Key results	18	Summarise key results with reference to study objectives
Limitations	19	Discuss limitations of the study, taking into account sources of potential bias or imprecision. Discuss both direction and magnitude of any potential bias
Interpretation	20	Give a cautious overall interpretation of results considering objectives, limitations, multiplicity of analyses, results from similar studies, and other relevant evidence
Generalisability	21	Discuss the generalisability (external validity) of the study results

Other information

Funding	22	Give the source of funding and the role of the funders for the present study and, if applicable, for the original study on which the present article is based
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*Give information separately for cases and controls in case-control studies and, if applicable, for exposed and unexposed groups in cohort and cross-sectional studies.

Note: An Explanation and Elaboration article discusses each checklist item and gives methodological background and published examples of transparent reporting. The STROBE checklist is best used in conjunction with this article (freely available on the Web sites of PLoS Medicine at <http://www.plosmedicine.org/>, Annals of Internal Medicine at <http://www.annals.org/>, and Epidemiology at <http://www.epidem.com/>). Information on the STROBE Initiative is available at www.strobe-statement.org.